

AUGUST 1988

HELENA

MONTANA

Amendment To Wastewater Facilities
Plan For Helena — Helena Valley

prepared by

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ACKNOWLEDGMENTS

The field investigations and condition ratings for the sanitary sewers that are included in this Wastewater Facilities Plan Amendment were done by the City of Helena's staff. The results of the City staff's efforts were contained in two reports: Sanitary Sewer Improvements for the Central Area and Sanitary Sewer Improvements for the Upper Westside Area. The results of these two studies were combined into this Wastewater Facilities Plan Amendment.

The Sanitary Sewer Improvements Program for the Central Area was done under the direction of Ted Hill, current Environmental Engineer for the City of Helena Wastewater Department.

The Sanitary Sewer Improvements Program for the Upper Westside Area was done under the direction of Mark Weston, former Environmental Engineer for the City of Helena Wastewater Department.

The TV inspection of the sewers, compilation of data, and assessment of the sewer main conditions were done by the City's sewer maintenance crew. Elmer Cole supervised the crew, Bill Horner operated the TV equipment and compiled the data, Rick Williamson operated TV equipment and jetted and cut roots in the sewers, Bob Hulbert performed various maintenance duties, and Dwain Wood typed and organized the reports.

The diligent efforts of these members of the City's Wastewater Department in inventorying and assessing the sanitary sewer system needs is appreciated and hereby acknowledged.

CHAPTER 1.0: INTRODUCTION

1.1 INTRODUCTION

The City of Helena's Wastewater Department inventoried and conducted studies on the condition of sanitary sewers in the central and upper westside areas of Helena where old sewer mains were known to have deteriorated. The results of these studies are contained in two reports prepared by the Wastewater Department. These reports are entitled "Sanitary Sewer Improvement Program, Upper Westside" completed in January 1987, and "Sanitary Sewer System Central Area Study" completed in April 1988. The results of these studies provided the information used for preparing this wastewater facilities plan amendment.

1.2 STUDY AREA

This facilities plan amendment combines the Upper Westside Study Area and the Central Study Area. The combined study area is bordered generally by Knight and Lyndale Avenues on the north, Montana Avenue on the east, the City limits on the south, and Mount Helena City Park and the City limits on the west. The exact study area is shown on the figures contained in this report.

1.3 POPULATION

The 1980 population for the City of Helena is 23,938 according to the 1980 Census. The population for the area within the study boundary is estimated to be 8,640. No formal population projections are available.

The City of Helena Planning Department estimates the 1988 population of Helena to be approximately 25,000. The minor population increase of about 1,000 people has occurred primarily in the southeastern part of Helena where a majority of the new residential development is being done.

The upper westside and central areas of Helena that are included within the study boundary have a stable population. The area is either fully developed or has terrain limitations that prohibit further development. Therefore, the future population is expected to be about the same as the existing population in the study area. This estimate is supported by the City of Helena Planning Department.

In the original Wastewater Facility Plan populations throughout the City were expected to be much higher. At that time rapid development was occurring and expected to continue. With a downturn in the economy, development came to a standstill and the optimistic projections of the time did not materialize. The present expectation of a stable population or slow growth represents current development activity and is considered to be more realistic.

1.4 PURPOSE

The purpose of this facilities plan amendment is to supplement the wastewater facilities plan done for the Helena-Helena Valley in 1978. At the time the original facilities plan was done, only trunk sewers were eligible for funding participation under the EPA construction grants program. Changes to the program now allow the State the discretion to fund collector sewers with part of their EPA construction grants allocation. A requirement of funding is having a current Wastewater Facilities Plan that covers the proposed improvements.

The intent of this amendment is to expand the original Wastewater Facilities Plan to include the collector sewers in the central and upper westside areas of Helena that are scheduled for replacement.

1.5 PUBLIC PARTICIPATION

The City of Helena actively encourages public participation in all of its projects. The City has a Citizen's Council appointed by the City Commission to represent citizens' interests and to assure public involvement. The Citizen's Council has been apprised by City staff of the condition of the sanitary sewers in the study area and have seen examples of the advanced deterioration of some of the sewers. The Citizen's Council will continue to be kept informed of the project as it develops.

The City also relies on the media to transmit information to the citizens of Helena. The City Commission receives very good newspaper and television coverage, particularly on projects of this nature, and it is anticipated the public will be informed by media coverage.

A formal public hearing will be held on the project as required by EPA. Public hearings are held during the City Commission's regular meetings every Monday night. The Draft Amendment to the Wastewater Facilities Plan will be advertised and the report made public at least 30 days in advance of the public hearing. If controversial issues arise, additional public meetings may be held at the City Commission's discretion. A summary of the public participation process and comments received will be included in the Final Report.

When and if the project is approved, an additional public hearing will be held on financing the project. Financial alternatives and the impact on sewer rates will be discussed thoroughly during these hearings.

CHAPTER 2.0: EXISTING SANITARY SEWER SYSTEM

2.1 BACKGROUND

The existing sanitary sewer system in many areas of the city was constructed between 1887 and 1907. The upper westside and central areas include neighborhoods served by the original sanitary sewer system. The pipe materials used in that area were either clay or cement, and many are 80 to 100 years old. Cement is a designation used on the original sewer maps but is actually an early concrete pipe. Recent sewer maintenance activities discovered extreme deterioration, primarily in the cement pipe.

Beginning in late 1984, the Wastewater Department began TV inspecting sewer lines in the study area. Each line that could be inspected was rated according to its condition and degree of deterioration. A sanitary sewer improvements program was developed from the inspection data.

2.2 TV INSPECTION SURVEY

TV inspection of the study area began in late 1984 and continued until 1988. The City's TV equipment records the information on a 3/4-inch video tape. Viewing these tapes can only be done in the TV van. The videos are transferred onto a 1/2-inch tape which can be viewed on any home VHS recorder. In 1985, the Wastewater Department began a video library on every line that is TV inspected. Most of the lines in the study area are now recorded in the library. In addition, the TV inspection data was logged on the inspection reports. An edited video has been prepared showing a typical section of clay, plastic, and deteriorated cement pipes. This video tape is a supplement to this report and is available for viewing.

2.3 COMPOSITION OF SANITARY SEWER SYSTEM

The sanitary sewer system in the study area consists of 181,326 feet (34.3 miles) of sewer lines ranging from 6-inch to 24-inch diameter pipe. The majority of the pipes are 8-inch and 9-inch diameter. The pipe materials include 1880's vintage cement pipe, clay pipe, and a newer concrete pipe. Table 1 lists the total length of each type of pipe, and Figure 1 shows existing sanitary sewers by type of pipe. The system has 504 manholes, 67 flushtanks, and 36 lampholes. The flushtanks no longer function and are abandoned in place. The flushtanks and lampholes do not allow proper access to the sanitary sewers for modern sewer maintenance equipment or TV inspection.

The sanitary sewer system originally was a combined system transporting sanitary sewage and storm water. Most of the storm water has been removed from the system by disconnecting storm water inlets and sealing manhole covers. Flow capacity in the existing lines is more than adequate for the sewer area.

TABLE 1
STUDY AREA SEWER SYSTEM AND TV INSPECTION INVENTORY

Pipe Material	Total Length (Feet)	Percent of Total Area	Length TV Inspected (Feet)	Length Not TV Inspected (Feet)	Percent Uninspected
Old Cement	73,480	40	51,589	21,891	29.8
Clay	89,914	50	27,320	62,594	69.6
New Concrete	5,810	3	470	5,340	91.9
PVC & Other	12,122	7	1,659	10,463	86.3
Totals	181,326	100	81,038	100,288	55.3

2.4 CONDITION OF SANITARY SEWER SYSTEM

A sewer pipe condition rating system was developed to assess the condition of each pipe. The rating is also used to prioritize replacement or repair. The rating system is shown in Table 2.

TABLE 2
SEWER PIPE CONDITION RATING SYSTEM

Rating	Description
1	Extreme deterioration, immediate replacement (within 5 years), structurally unsound, maintenance impaired - no jetting advised, discontinue maintenance except for root control.
2	Poor condition - general deterioration, replacement in 5 to 10 years.
3	Immediate spot repairs, wide joints, structurally unsound, pitted pipes, high root areas, and sagging.
4	Fair condition - no replacement within 10 years.
5	Normal wear - no replacement scheduled, good condition.

Each video tape and TV log were reviewed and rated by the Wastewater Department. The review team consisted of the TV Equipment Operator, Sewer Maintenance Foreman, and the Environmental Engineer. Pipe materials, sizes, TV inspection, and condition ratings for the entire study area are shown in the Appendix.

Figure 2 shows the condition of the existing sanitary sewers where TV inspected and rated.

2.5 MANHOLE SURVEY

Along with the TV inspection of the mains, manholes in the study area were inspected. The existing manholes are generally in good shape; however, 6 manholes have deteriorated to the point of needing replacement, 20 manholes need interior repairs, and 116 manholes need new rings and covers. Manhole interior repairs can be conducted by City personnel.

For complete access to the sewer lines, 107 new manholes are needed. These manholes either replace flushtanks or lampholes or are needed at a bend or tee in the sewer line. New manholes on cement pipe have the highest priority due to the deteriorated condition of the pipe. Many of these manholes will be replaced in the course of needed line replacements. Additionally, some existing manholes in adequate condition along lines to be replaced would be more economically replaced than re-used.

Figure 2

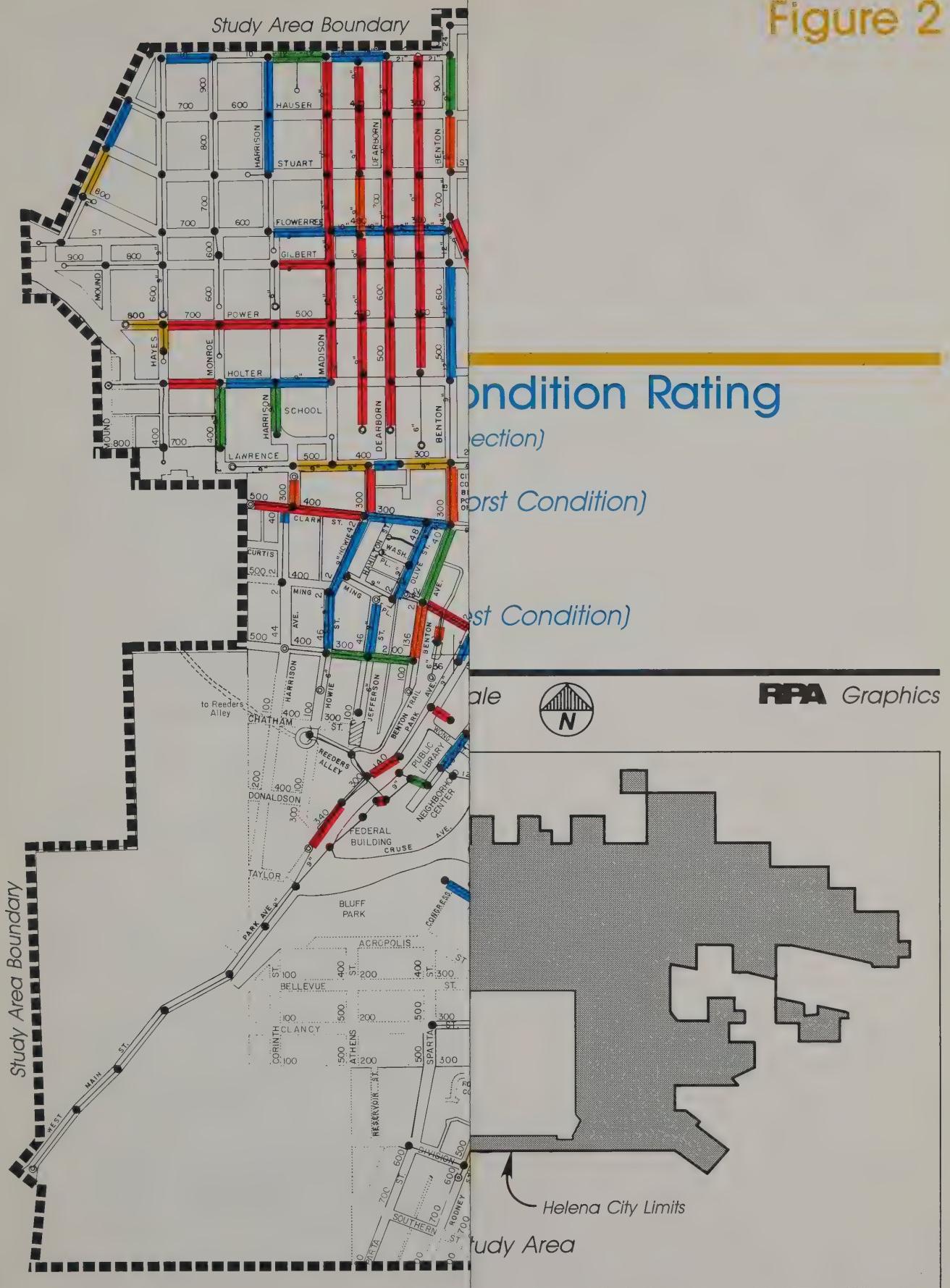
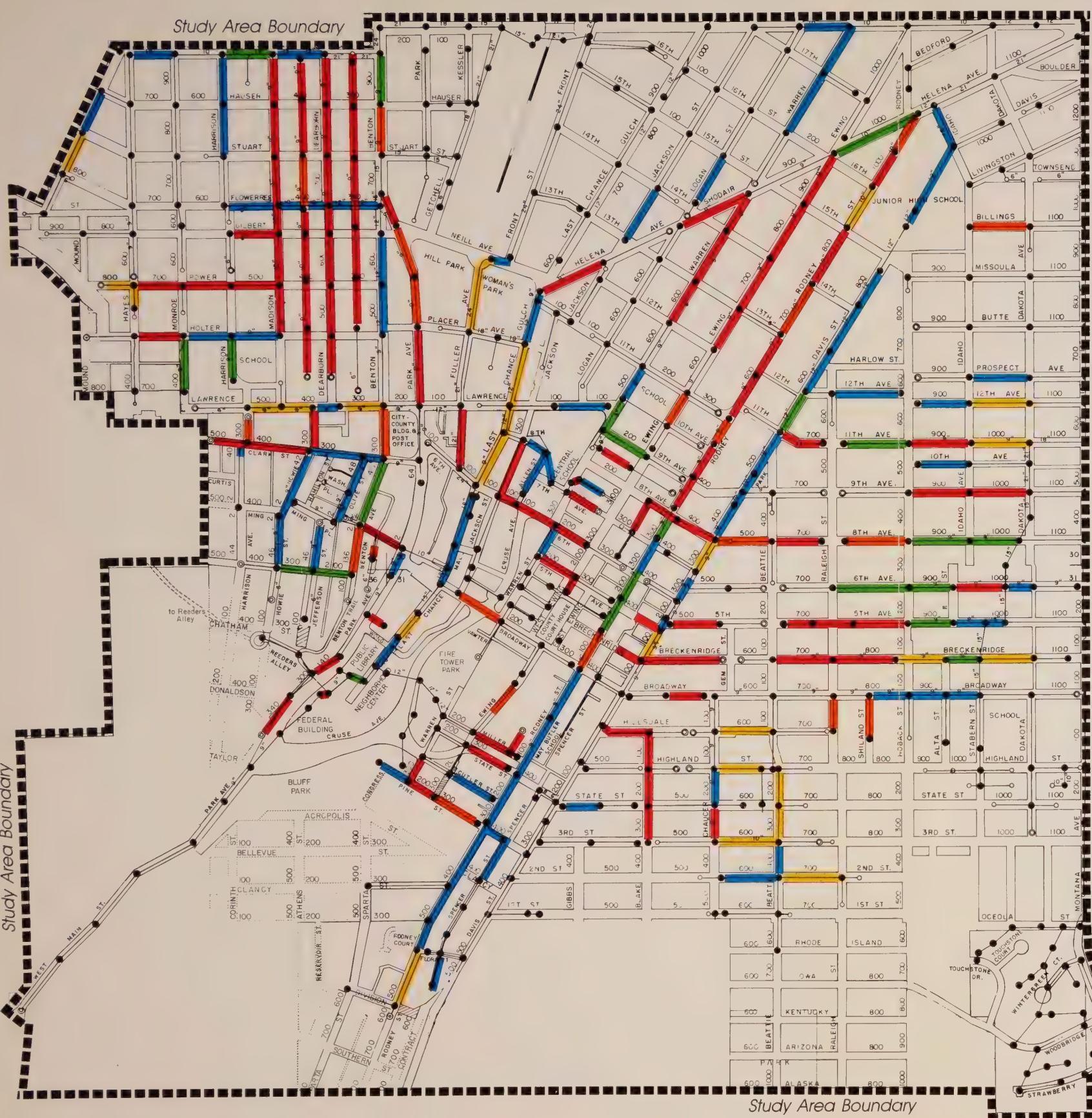


Figure 2



Sewer Condition Rating

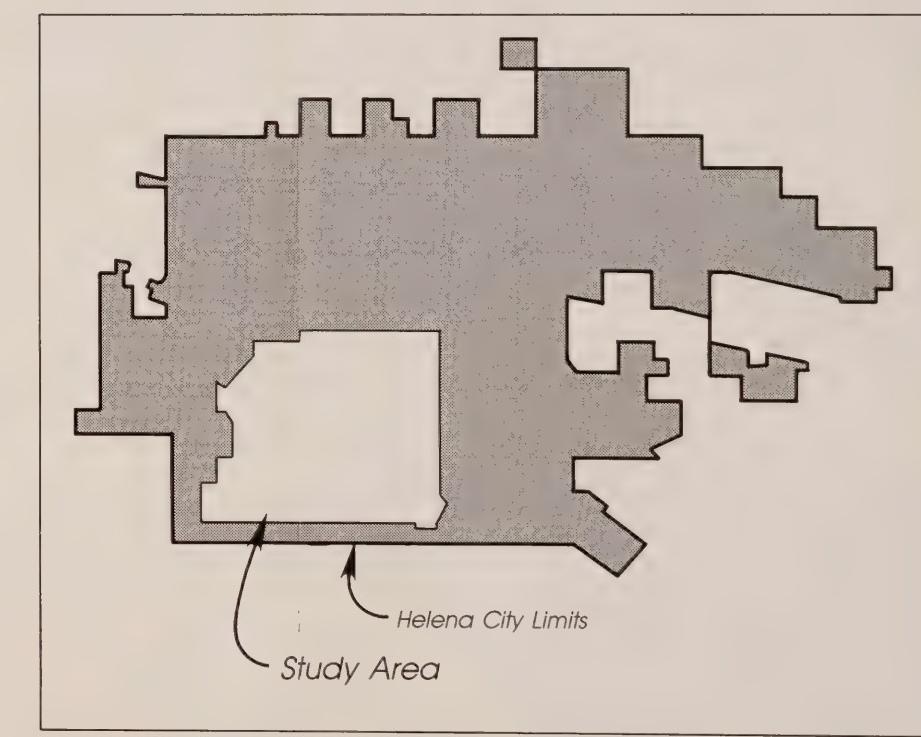
(Based on TV Inspection)

- A horizontal scale consisting of five colored bars, each labeled with a number. The numbers increase from left to right: 1 (Worst Condition), 2, 3, 4, and 5 (Best Condition). The bars are colored red, orange, yellow, green, and blue respectively.

Map – Not to Scale



RPA Graphics



CHAPTER 3.0: SANITARY SEWER IMPROVEMENTS PROGRAM

3.1 ALTERNATIVES CONSIDERED

Collection system needs within the study area consist of replacing or repairing existing lines to correct problems identified during the TV inspection. No new line construction in unsewered areas is anticipated.

Problems documented from city sewer inspections and maintenance involve pipe integrity and obstructions rather than inadequate line capacity (diameter and slope). Hence replacement lines will be of similar size, laid to similar grades. If grades which do not meet Ten States Standards minimums are encountered, they will be corrected during design within the limits of matching adjacent sections of the collection system.

The lines programmed for replacement all have numerous service connections. Logically, replacement should be accomplished in the same location as the existing sewer main, which limits the practical alternatives to be considered. Several collection system alternatives appropriate to new or rural systems can be discarded immediately as impractical given the existing conventional gravity system. These include the following:

- Small diameter gravity sewers and septic tanks
- Pressure sewers with grinder pumps
- Vacuum sewers
- On-site treatment systems

These would all entail a radical departure from the gravity sewers to which the new improvements must connect. Hence, they can be dropped from further consideration.

Remaining alternatives lending themselves to gravity sewer replacement include three primary options. All would retain the conventional gravity sewer concept of the existing system. These options are briefly described as follows:

Sewer Removal and Replacement: Deteriorated sewer mains would be removed and replaced by open excavation. New SDR 35 PVC plastic pipe would be laid. Existing service connections would be re-coupled to the new mains, necessitating laying the new mains to approximately the same grades and alignments as the existing ones. Bypass pumping is required around the block of main being installed.

Slip-Lining Existing Mains: Continuous flexible polyethylene pipe would be pulled through existing mains between manholes. Minimum excavation is required for installation of the slip-liner, however, service connections have to be excavated to allow tapping through the liner sleeve. Bypass pumping is not necessary because the liner can be pulled while sewage flows through

the line. The pipe lining would provide a new flow surface and restore structural integrity. Some reduction of diameter would result, reducing capacity accordingly. Since lines in the study area are not capacity limited at the present time, this reduction is not considered critical.

"In-Situ Form" Lining: An alternate to conventional slip-lining is available in the form of the proprietary "In-Situ Form" process. This involves the insertion of a resin impregnated felt sock inside the existing main between manholes. No excavation is necessary. Hot water is pumped through the sock to form it to the interior of the existing pipe and activate the resin, yielding a rigid plastic liner. Bypass pumping is required while installation is performed. Structural integrity and flow characteristics are restored. A slight diameter reduction results. Service connections are cut open from the inside using a camera-guided cutting machine. Where existing main invert are deteriorated or gone, the sock will nonetheless form to the adjacent surface.

All three of these alternatives retain a conventional gravity sewer system, and as such can be considered comparable. Costs per foot of pipe installed vary, but after service reconnection, excavation, and pavement costs are included as applicable, net installed cost is very similar. Table 3 compares costs for 10-inch diameter main.

TABLE 3

**COST COMPARISON OF EXCAVATED MAIN REPLACEMENT TO SLIP-LINING AND "IN-SITU FORM" PROCESS
(10-INCH DIAMETER, ONE-BLOCK LENGTH)**

Item	Excavated Main Replacement	Slip-Lining	In-Situ Form
Main Excavation (480 cy @ \$5/cy)	\$ 2,400	\$ 1,000	\$ 0
Replacement Pipe, 360' (unit price below)	11,520 (32)	7,200 (20)	18,720 (52)
Serv. Connect. w/Excav. if req'd., 8/blk. (unit price below)	1,600 (200)	12,000 (1,500)	2,800 (350)
Clean Exist. Main (360' @ \$7.30/ft)	0	2,630	2,630
Bypass Pumping (1 blk.)	3,000	0	3,000
Pavement Replacement (480 sy @ \$20/sy)	9,600	4,000 (200 sy)	0
 TOTAL COST PER BLOCK	 \$28,120	 \$26,830	 \$27,150
 Useful Life	 40 yr.	 30 yr.	 30 yr.
Salvage Value after 20 yr.	\$14,060	\$ 8,943	\$ 9,050
Present Worth of Salvage (8 5/8%)	\$ 2,688	\$ 1,710	\$ 1,730
 PRESENT WORTH PER BLOCK	 \$25,432	 \$25,210	 \$25,420

These alternatives can realistically be viewed as merely different construction techniques. Each has relative merits for particular situations, and should be considered on a block-by-block basis during design. Further cost distinctions will not be considered, and the alternatives will be considered as comparable in their cost-effectiveness. Final choices of the appropriate construction techniques will be made during design. Excavated main removal and replacement cost estimates are representative, permitting substitution of an alternate methodology where conditions warrant.

Other alternatives include "No-Action" and upgraded operation and maintenance.

The "No-Action" alternative would be to leave the sanitary sewers as they are. This is not practical because, without some action being taken, the sewers will continue to deteriorate until they can no longer provide service. In fact, the concrete sewers would eventually disintegrate. Without sanitary sewer service to the area, the residents would either have to relocate or find alternatives to a centralized sewer system, such as septic tanks. The soil in the area is not suitable for septic tanks, and this alternative would lead to unacceptable health hazards and ground water contamination. The "No-Action" alternative was, therefore, discarded.

Improved maintenance would help to keep some of the sanitary sewers operating for a limited amount of time. However, as shown in the photographs later in this chapter, the sewer pipe materials are disintegrating. In some cases, the sewers no longer have an invert and sewage is flowing across open ground. In other areas, maintenance cannot be done because the sewers have deteriorated to the extent that maintenance such as jetting could cause them to collapse. Improved operation and maintenance cannot restore the integrity of the sewers or reverse the deterioration process. Therefore, this alternative has also been discarded as impractical.

The sanitary sewers have been in service for 90 to 100 years, which is way beyond their expected service life. The City has received full value for their initial investment, and replacement (or an equivalent alternative) is now warranted.

3.2 RECOMMENDED IMPROVEMENTS

Recommended improvements to the collection system in the study area have been based on the TV-inspections and analysis presented in Chapter 2. Given the definition of the condition ratings established by the City, lines with Ratings "1" or "2" need immediate replacement. Lines with higher ratings appear adequate for the duration of the planning period, although slightly escalated maintenance can be anticipated for conditions "3" and to a lesser extent "4".

Since TV-inspection was not performed on all lines in the study area, simply replacing those inspected and rated as poor condition is not sufficient. Comparison of

Figures 1 and 2 illustrates strong correlation between poor condition lines and those constructed of (old) cement pipe. TV-inspection bears this out with frequent and conspicuous deterioration of this pipe type. Photos 1 and 2 illustrate how badly some of the original cement pipe has deteriorated. Poor condition ratings are far less common with clay pipe, and almost nonexistent with newer concrete pipe.

This suggests an additional criteria for line replacement, i.e., lines of like material adjacent condition "1" or "2" pipes can be presumed to be similar. Hence, such lines have also been included for replacement. Both TV inspected lines and lines presumed to be condition "1" or "2" which are expected to be replaced are shown in Figure 3.

Given the standardization of modern PVC sewer pipe sizes, it has been assumed that existing 6- and 8-inch lines would be replaced with 8-inch pipe. Six-inch sewers are also prohibited under Ten State Standards. Likewise, 9- and 10-inch lines would be replaced with 10-inch pipe. Other line sizes can be replaced to match existing diameters. The exception would be if slip-lining or in-situ forming were used in lieu of replacement. Then existing pipe sizes would remain as is except for the loss in diameter due to the process used.

The extent of line replacement needed within the study area dictates that numerous manholes along these line will also have to be replaced. It has been determined that existing manholes lying between two or more replacement lines would be more practical and cheaper to replace than retain. Many of the manhole replacements shown in Figure 3 fall into this category.

PHOTOGRAPHS

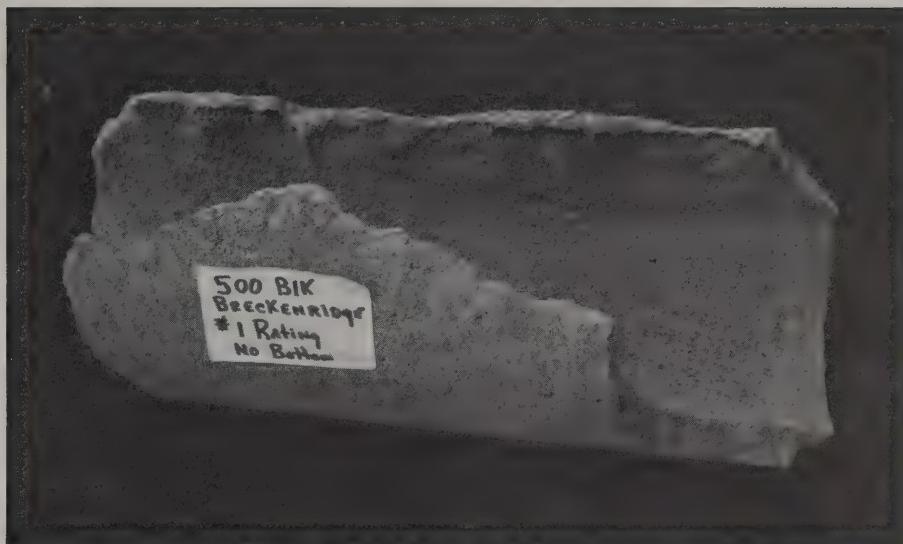


Photo 1: Cement pipe from the 500 Block of Breckenridge. This pipe has no invert (bottom) and is rated condition #1 which is the worst rating.

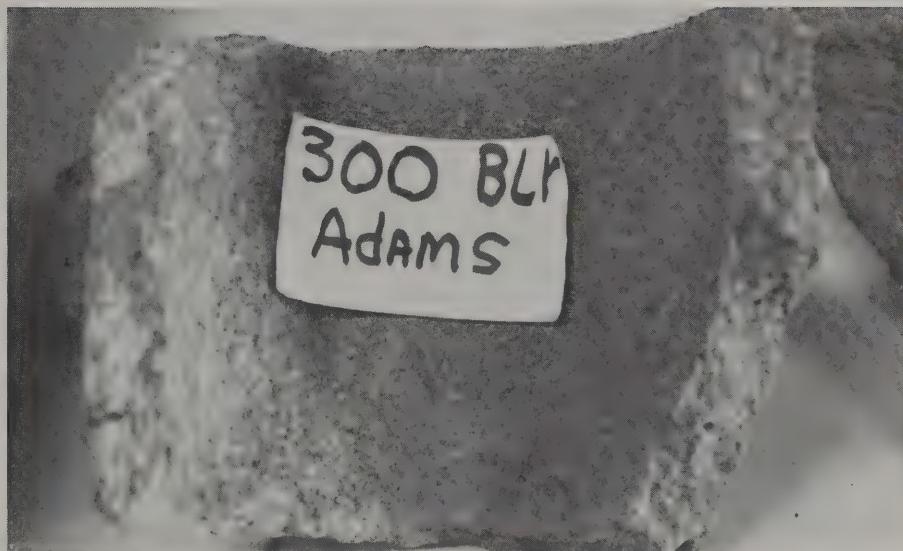


Photo 2: A section of concrete pipe from the 300 Block of Adams. The pipe deteriorated into small, broken sections which no longer provide a suitable conduit for sewage.

Figure 3

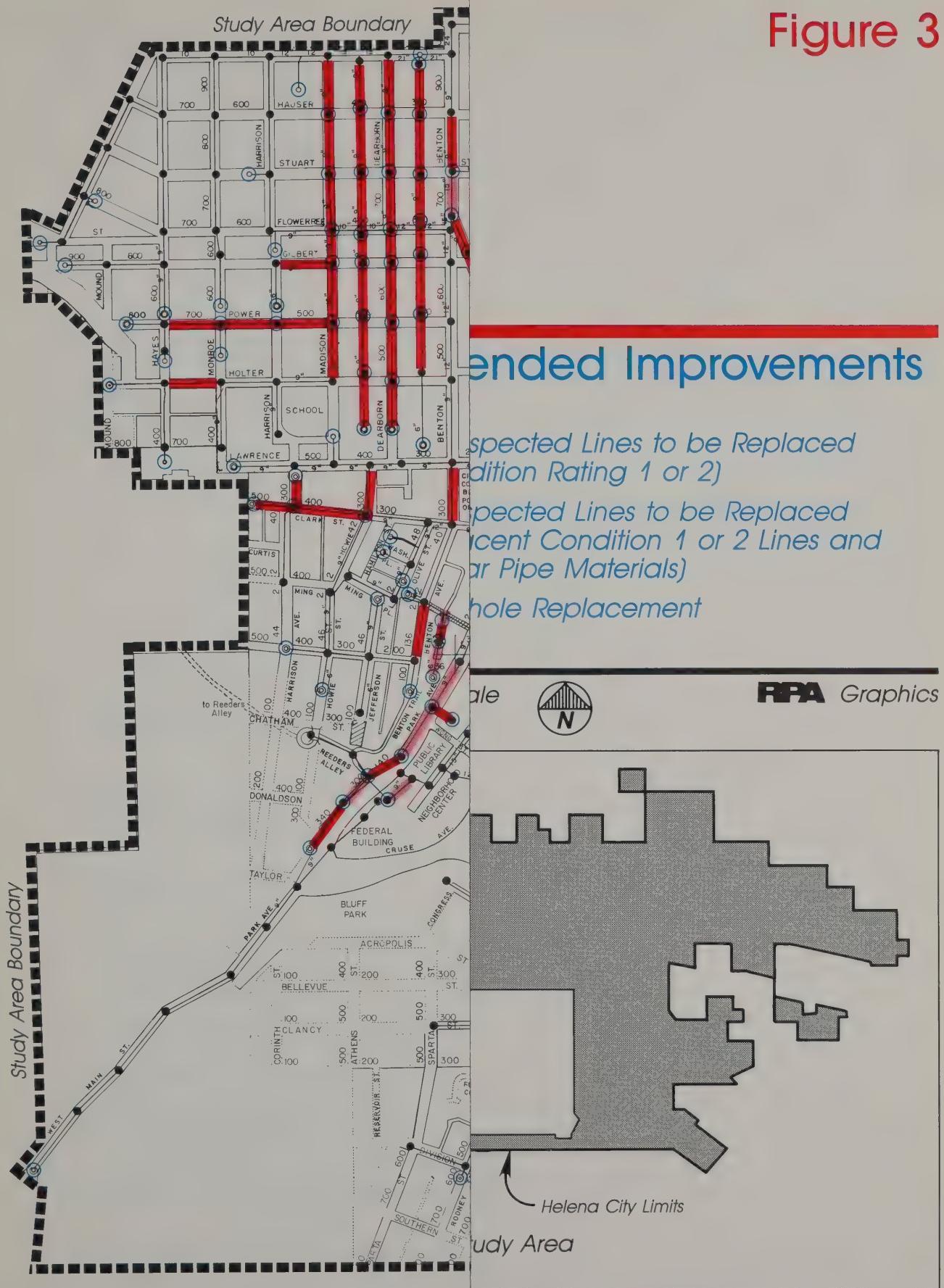
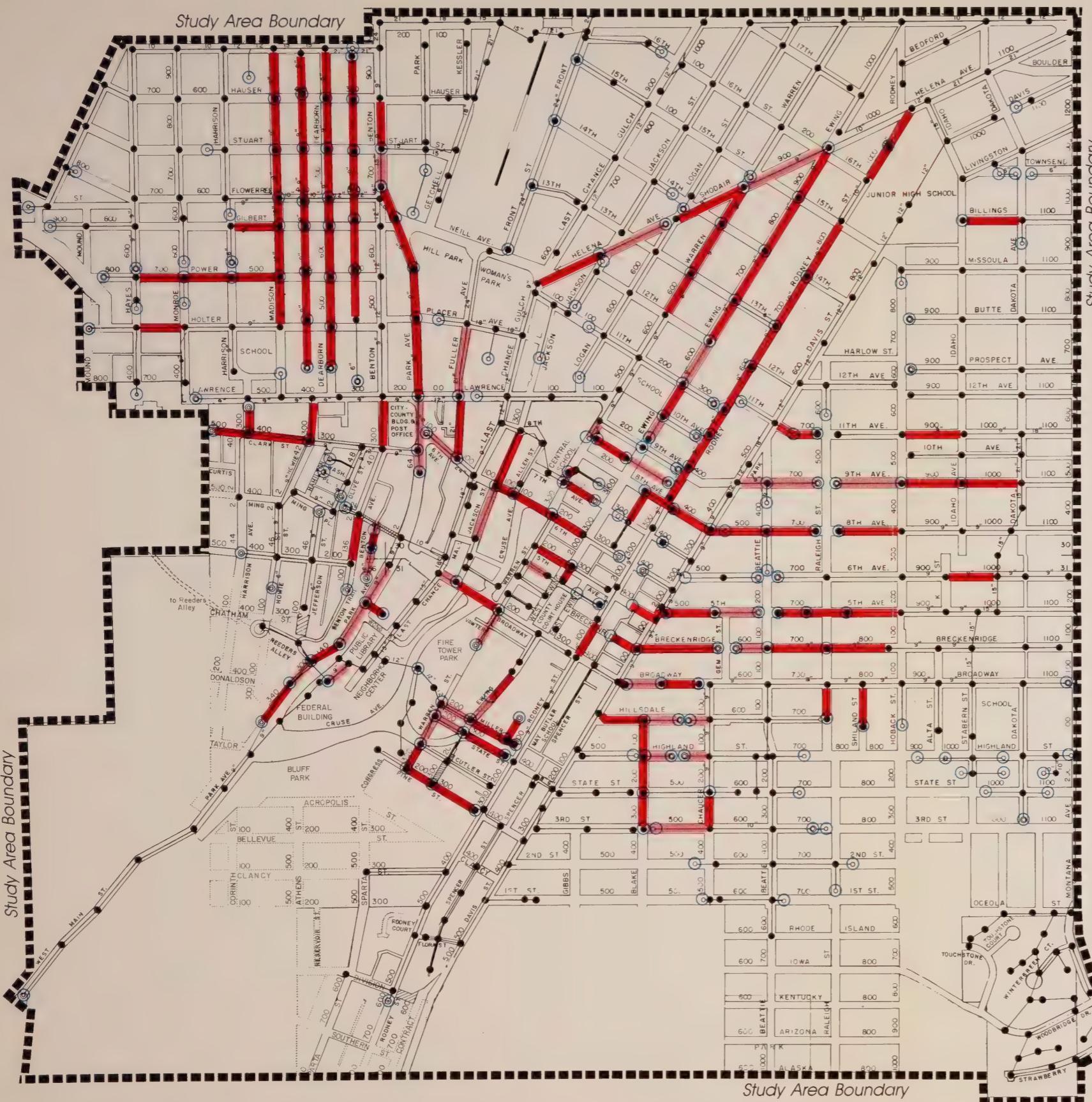


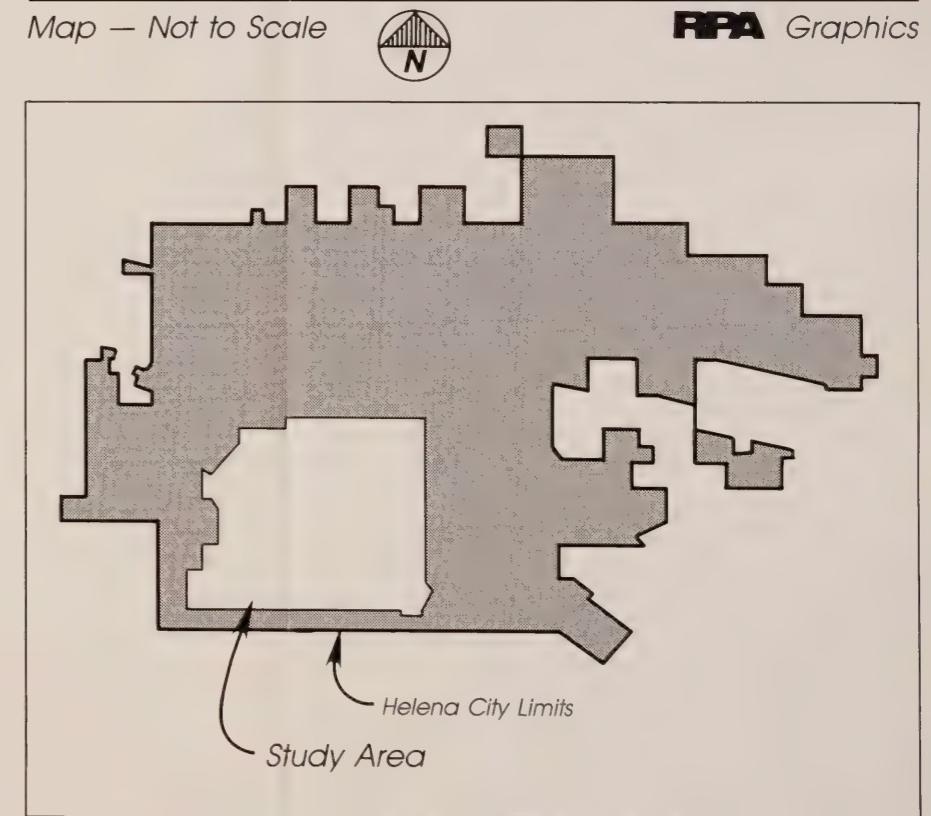
Figure 3



Recommended Improvements

- TV Inspected Lines to be Replaced (Condition Rating 1 or 2)
- Uninspected Lines to be Replaced (Adjacent Condition 1 or 2 Lines and Similar Pipe Materials)
- Manhole Replacement

Map – Not to Scale



Additionally there are approximately 93 new manholes needed to correct one of the following conditions (other than in conjunction with main replacements):

- Structurally unsound or deteriorated condition (primarily existing brick manholes)
- Additional points of access needed to the collection system for maintenance and inspection
- Replacement of existing lampholes or flushtanks with manholes

These are also shown in Figure 3.

A final needed improvement is the replacement of existing cast iron rings and covers on 116 manholes. Existing rings and covers at these locations have been found during inspection to be structurally unsound, cracked, or loose fitting. New and properly fitted units should be procured and installed. Benefits of improved safety, reduced liability, and possible inflow reductions would result.

Table 4 summarizes the recommended improvements .

TABLE 4
SUMMARY OF RECOMMENDED IMPROVEMENTS

Item	Quantity
Replace Exist. 6" & 8" Lines with 8" PVC (Inspected Footage = 19,811 lf) (Uninspected Footage = 9,360 lf) (Additional for MH Reconections = 1,860 lf)	31,030 lf
Replace Exist. 9" & 10" Lines with 10" PVC (Inspected Footage = 18,545 lf) (Uninspected Footage = 2,880 lf)	21,425 lf
Replace Existing 15" Lines with New PVC (Uninspected)	400 lf
Replace Existing 21" Lines with New PVC (Inspected Footage = 490 lf) (Uninspected Footage = 610 lf)	1,100 lf
Manhole Replacements Along Replacement Lines	140
Other Additional New or Replacement Manhole	93
New Manhole Rings and Covers	116

These improvements are also summarized in Figure 3.

Completing the improvements as described will enable the City's sewer maintenance crews to properly maintain the sanitary sewer system. Access to the sewers will be possible because flush tanks, lampholes, and deteriorated manholes will be replaced. Jetting, removing roots, and TV inspections will again be possible because unstable pipe will be replaced; and there will no longer be a danger of sewers collapsing. These operation and maintenance activities are standard procedures for the City of Helena, and will continue on the new sewer system to assure they remain in good operating condition for their service lives.

3.3 COST ESTIMATES

Costs have been estimated for the recommended improvements in Table 5. This cost analysis presumes replacement of lines by excavation and installation of new PVC pipe. New manholes would be reinforced precast concrete.

TABLE 5
COST ESTIMATE FOR RECOMMENDED IMPROVEMENTS

Item	Quantity	Price	Cost	Useful Life (yrs.)	Equivalent Annual Cost (8 5/8%)
8" Replacement Sewer (incl. removal of exist. sewer and bypass pumping)	31,030 lf	\$ 35/lf	\$1,086,050	40	\$ 97,225
10" Replacement Sewer (incl. removal of exist. sewer and bypass pumping)	21,425 lf	40/lf	857,000	40	76,720
15" Replacement Sewer (incl. removal of exist. sewer and bypass pumping)	400 lf	46/lf	18,400	40	1,646
21" Replacement Sewer (incl. removal of exist. sewer and bypass pumping)	1,100 lf	65/lf	71,500	40	6,400
Trench Excavation and Backfill for Replacement Sewer (shored)	72,000 cy	5/cy	360,000	40	32,228

TABLE 5 (CONT.)

COST ESTIMATE FOR RECOMMENDED IMPROVEMENTS

Item	Quantity	Price	Cost	Useful Life (yrs.)	Equivalent Annual Cost (8 5/8%)
Replacement Manholes (incl. removal of exist. manhole)	233 ea	2,500/ea	582,500	40	52,146
4" Service Connection	855 ea	200/ea	171,000	40	15,308
6" Service Connection	45 ea	275/ea	12,375	40	1,108
New Manhole Rings and Covers (Installed)	116 ea	250/ea	29,000	40	2,596
Water Main Relocations at Crossings	20 ea	2,500/ea	50,000	40	4,476
Misc. Concrete Removal and Replacement	500 sy	25/sy	12,500	40	1,119
Asphalt Pavement Removal and Replacement (incl. Base Course)	72,000 sy	25/sy	<u>1,440,000</u>	40	<u>128,910</u>
Subtotal:			\$4,690,300		\$419,882
Plus 25% Contingencies, Engineering and Miscellaneous			1,172,600	40	104,973
Total:			\$5,862,900		\$524,855

During engineering design, consideration can be given to substituting either slip-lining or the "In-Situ Form" process where conditions favor these techniques. As discussed previously, costs for all three methods are essentially comparable. Certain portions of the urban area may lend themselves better to one of the "no dig" options rather than open excavation to simplify construction and reduce public inconvenience.

3.4 FINANCIAL CAPABILITY

The total project costs are estimated to be \$5,862,000. Funding options that are being considered by the City of Helena include a citywide increase in sewer rates, a special improvement district within the study area boundary, and a sewer rate surcharge for those within the study area boundary. The most likely options are either a citywide sewer rate increase or a sewer rate surcharge within the study area boundary. The impact on the current sewer rate structure for a typical family of four both with and without an EPA construction grant for these two options are as follows:

Option 1 - Citywide Sewer Rate Increase (8,140 Users)

	<u>With EPA Grant</u>	<u>Without EPA Grant</u>
Project Cost	\$5,862,900.00	\$5,862,900.00
EPA Construction Grant (55%)	3,224,595.00	--
City of Helena Local Share (45%)	2,638,305.00	--
Revenue Bond Annual Payment (20 yr. @ 9%)	\$ 289,017.00	\$ 642,260.00
Current Revenue from Sewer Service	\$1,146,825.00	\$1,146,825.00
% Increase Required to Fund Bond Payment	25%	56%
Current Average Annual Sewer Bill (Family of 4)	\$ 121.68	\$ 121.68
Increase for Bond Payment	<u>30.42</u>	<u>68.14</u>
Estimated Average Annual Sewer Bill	\$ 152.10	\$ 189.82

Option 2 - Sewer Surcharge in Study Area (2,997 Users)

	<u>With EPA Grant</u>	<u>Without EPA Grant</u>
Project Cost	\$5,862,900.00	\$5,862,900.00
EPA Construction Grant (55%)	3,224,595.00	--
City of Helena Local Share (45%)	2,638,305.00	--
Revenue Bond Annual Payment (20 yr. @ 9%)	\$ 289,017.00	\$ 642,260.00
Study Area Sewer Revenue (2,997/8,140)(1,146,825)	\$ 422,240.00	\$ 422,240.00
% Increase to Fund Bond Payment	69%	152%
Current Average Annual Sewer Bill (Family of 4)	\$ 121.68	\$ 121.68
Increase for Bond Payment	<u>83.96</u>	<u>184.95</u>
Estimated Average Annual Sewer Bill	\$ 205.64	\$ 306.63

These computations are based on estimates and will fluctuate according to actual costs and interest rates.

The mean annual household income for the City of Helena is \$19,199.00. The following shows the percent of mean average annual household income for each estimated sewer rate. Note that the most recent income information is from the 1980 Census.

	<u>Sewer Rate</u>	<u>Percent Mean Annual Income</u>
Current Sewer Rate (Family of 4)	\$121.68	0.63
Citywide Rate Increase with EPA Grant	152.10	0.79
Citywide Rate Increase without EPA Grant	189.82	0.99
Study Area Rate Increase with EPA Grant	205.64	1.07
Study Area Rate Increase without EPA Grant	306.63	1.60

The project entails replacing existing City sewers which are included in the City's sewer maintenance budget. The replacement sewers will require, if anything, less maintenance than the existing sewers. Therefore, maintenance costs have not been included as a consideration in the cost analysis.

3.5 IMPLEMENTATION SCHEDULE

Implementing the recommended improvements will require specific action by the City of Helena. The following table lists the major tasks to be accomplished and the anticipated time schedule:

	<u>Task</u>	<u>Schedule</u>
1.	Complete Preliminary Amended WWFP Draft Report	July - Aug. 1988
2.	City and MDHES Review and Comments on Draft Report	August 1988
3.	Incorporate Comments and Submit Final Draft	August 1988
4.	Advertise for Public Hearing on Plan	August 1988
5.	Hold Public Hearing on Plan	Sept. 19, 1988
6.	Incorporate Hearing Comments and Complete Final Report	September 1988
7.	City and MDHES Review and Comments on Final Report	September 1988
8.	Step 2 + 3 Grant Offer from MDHES and City Acceptance	September 1988
9.	Design Additional Manholes for Sewer Inspection	Oct. - Dec. 1988
10.	Bid and Award Manhole Contract	February 1989
11.	Construct Manhole Project	May - Sept. 1989
12.	Design Sewer Replacement Project	Jan. - Oct. 1989
13.	Bid Award of Contract and Bond Sale	January 1990
14.	Construction of Sewer Replacement Project	May 1990 - Sept. 1991

CHAPTER 4.0 ENVIRONMENTAL CONSIDERATIONS

4.1 INTRODUCTION

This project is an amendment to the Wastewater Facilities Plan for Helena-Helena Valley, Montana that was prepared in 1978. At the time of the original Facilities Plan, a detailed environmental assessment of the entire project was prepared.

This section addressing environmental considerations is intended to focus only on the improvements included under this amendment and is a supplement to the original environmental assessment.

4.2 PROPOSED ACTION

This project consists of replacing or repairing existing sanitary sewer mains and manholes in the south central and upper westside areas of Helena.

The purpose of the project is to replace sewers that have deteriorated due to age and type of material. Original sewers made of cement that were installed around the turn of the century were found to be particularly troublesome.

There will be no new sewers or extensions of sewers into areas that were not previously sewerized. The only variation from existing facilities will be replacing flush-tanks and lampholes with conventional manholes so access to sewers can be obtained. Since there are no apparent capacity problems, the size of replacement or repaired facilities will be similar to existing facilities.

4.3 AFFECTED ENVIRONMENT

The project is inside the corporate limits of Helena in the oldest developed area of the City. The area includes both residential and commercial areas which have been sewerized for up to 100 years.

Existing sewers are in paved streets. Sanitary sewers share the street right-of-way with other utilities. Most of the residential areas are lined with mature trees in boulevards, and many buildings have architectural and historical value because of their age and construction.

4.4 ENVIRONMENTAL CONSEQUENCES

Construction activities will affect the area during the replacement or repair of sewers. Pavement removal, excavation, sewer or manhole installation, backfilling and compaction, and pavement replacement will be the primary construction activities.

During construction, traffic flow will be interrupted, access to residences and buildings will be hampered, dust and noise levels will be increased, and energy will be expended. These impacts are temporary and will be mitigated by contract documents and specifications that will limit the extent of the disturbances allowed. Since all of the construction will take place in the streets, no damage to adjacent buildings or other facilities will occur.

The existing sewers have deteriorated to the point where sewage leaks through the sewer system and induces contaminants into the ground. In some cases the inverts of the sewers have disintegrated, and the sewage is flowing across open soil which could contaminate the ground water.

Depth to ground water in project area varies considerably. The shallowest ground water occurs along Last Change Gulch which has the highest potential for ground water contamination. In the remaining areas of the project, there is the potential that leaking sewage could enter the storm drain system and be transported with drainage.

Since the project area is in the upper reaches of the Helena Valley, any ground water contamination occurring in the project area could affect large portions of the Helena Valley aquifer. Wells in the valley that are presently used to serve individual households and subdivisions could be affected if the ground water becomes contaminated.

Standard sewer maintenance activities such as jetting and cutting roots are not practical in many of the sewers because of very poor condition of the sewer pipe. This increases the likelihood of plugged sewer lines and backing sewage up into buildings. Many of the buildings in the area have historical value and could be damaged by backed-up sewers.

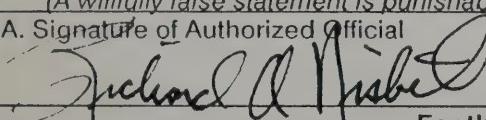
This project will return the sewers to serviceable condition and limit the leakage from the sewers to acceptable amounts. The new sewers can be adequately maintained and provide better and more reliable service. The long-term effect of the project will be beneficial.

**APPENDIX A: PREAWARD COMPLIANCE REVIEW
REPORT FOR WASTEWATER
TREATMENT CONSTRUCTION GRANTS**

EPA Preaward Compliance Review Report For Wastewater Treatment Construction Grants

Form Approved.
OMB No. 2090-0014.
Expires 8-31-89

Note: Read Instructions on Reverse Before Completing Form.

I. A. Applicant (Name and State)		City of Helena Helena, Montana	B. EPA Project No.
II. A. Are any civil rights lawsuits or complaints pending against applicant? If "Yes," list those complaints and the disposition of each complaint.			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
II. B. Have any civil rights compliance reviews been conducted during the two years prior to this application for activities which would receive EPA assistance? If "Yes," list those compliance reviews and status of each review.			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
III. A. Population Characteristics			Number of People
1. A. Population of Entire Service Area			23,938
B. Minority Population of Entire Service Area			661
2. A. Population currently served			8,640
B. Minority Population Currently Being Served			204
3. A. Population to be served by project			8,640
B. Minority population to be served by project			204
4. A. Population to remain without service			0
B. Minority population to remain without service			0
B. If entire community under the applicant's jurisdiction is not served under the existing facilities or will not be served under the proposed plan, give reasons why. The entire city is served by the City's wastewater facilities. However, the sewers that are oldest and in the worst condition are located within this project area, and have the highest priority for repair and replacement.			
C. Give the schedule for future construction by which treatment system service will be provided to all inhabitants within applicant's jurisdiction. If there is no schedule, explain why. All residents are presently being served and will continue to be served.			
D. Is another Federal Agency being asked or already providing financial assistance to any construction associated with this project? If "Yes," list the other Federal Agency(s), describe the associated work and the dollar amount of assistance.			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
E. Will all new facilities or alterations to existing facilities financed by this grant be designed and constructed to be readily accessible and useable by handicapped persons? If "No," explain how a regulatory exception (40 CFR 7.70) applies.			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
IV. Certification I certify that the information given above is true and correct to the best of my knowledge or belief. <i>(A willfully false statement is punishable by law: U.S. Code, Title 18, Section 1001)</i>			
A. Signature of Authorized Official 	B. Title of Authorized Official <i>Acting City Manager</i>	C. Date <i>8-25-88</i>	
For the U.S. Environmental Protection Agency			
<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	Regional Director of Civil Rights	Date	

APPENDIX B: COMPUTER SUMMARY OF STUDY AREA SEWER SYSTEM

Record#	MANHOLE#	TYPE	DESCRIPTION	LENGTH	SIZE	Pipe Type	AreaCode	MainRate
1	005-3	PLASADD	PLACER & MAIN	210-1	18	VCP	48	NR
2	006-1		NORTH MAIN & HELENA AVE IN	005-2	9	CMT	48	5
3	006-2		HELENA & JACKSON 1W	006-1	525	9	CMT	48
4	007-1		13TH & JACKSON	269-1	474	9	VCP	48
5	007-3T		LOGAN & HELENA 1W	006-2	495	9	CMT	48
6	007-4		LOGAN & HELENA	008-1	563	9	CMT	48
7	008-1		WARREN & HELENA	009-1	660	9	CMT	48
8	009-1		HELENA & EWING	010-1	650	10	CMT	48
9	010-1		HELENA & RODNEY	011-3	195	12	VCP	48
10	011-1		RODNEY & BEDFORD 1E	299-1	370	8	VCP	48
11	011-2		RODNEY & BEDFORD	023-2	175	8	VCP	48
12	011-3		HELENA & IDAHO	011-4	510	21	VCP	48
13	011-4		DAKOTA & HELENA	012-1	719	21	VCP	48
14	021-2		HELENA & FRONT STREET	021-3	225	24	VCP	48
15	022-1		12TH & WARREN	023-1	360	9	CMT	48
16	023-1		14TH & WARREN	024-2	441	9	CMT	48
17	023-2		13TH & WARREN	023-1	360	9	CMT	48
18	024-2		12TH & WARREN	008-1	314	9	CMT	48
19	028-1		14TH & WARREN	029-2	360	9	CMT	48
20	029-1		12TH & EWING	030-1	441	9	CMT	48
21	029-2		13TH & EWING	029-1	360	9	CMT	48
22	030-1		12TH & EWING	031-1	476	9	CMT	48
23	031-1		14TH & EWING	009-1	392	9	CMT	48
24	041-1		11TH & RODNEY IS	042-1	360	9	CMT	48
25	042-1		12TH & RODNEY IS	042-2	417	9	CMT	48
26	042-2		13TH & RODNEY	043-2	407	10	CMT	48
27	042-2L		13TH & RODNEY 1W	042-2	350	6	VCP	48
28	043-1		15TH & RODNEY	044-1	364	10	CMT	48
29	043-2		14TH & RODNEY	043-1	470	10	CPN	48
30	044-1		16TH & RODNEY	044-1A	250	10	CMT	48
31	044-1A		16TH & RODNEY IN	010-1	295	10	CMT	48
32	050-1		11TH & DAVIS	051-1	358	12	VCP	48
33	051-1		12TH & DAVIS	051-2	341	12	VCP	48
34	051-2		12TH & DAVIS IN	052-2A	214	12	VCP	48
35	052-1		15TH & DAVIS IN	053-2	330	12	VCP	48
36	052-2		14TH & DAVIS IN	052-1	293	12	VCP	48
37	052-2A		14TH & DAVIS IN	052-2	217	12	VCP	48
38	053-1		15TH & DAVIS 2N	054-1	530	12	VCP	48
39	053-2		15TH & DAVIS IN	053-1	193	12	VCP	48
40	054-1		14TH & DAVIS	011-3	322	15	VCP	48
41	054-1L		DAVIS & DAKOTA 1W	054-1	405	8	CNP	48
42	060-3A		TOWNSEND & MONTANA 1W	060-3	301	6	VCP	48
43	081-1		PLACER & PARK	082-1	339	9	CMT	48
44	082-1		PARK & PLACER IN	083-2	430	9	CMT	48
45	083-2		PARK & NEIL AV	083-1	281	9	CMT	48
46	091-1		LYNDALE & BENTON	171-1	352	21	VCP	48
47	117-1		STUART & BENTON	090-2	337	15	VCP	48
48	117-1		STUART & NORTH PARK	117-2	231	15	VCP	48
49	117-1L		STUART & NORTH PARK 1S	117-1	485	8	VCP	48
50	117-2		GETCHELL & STUART IN	118-1	438	18	VCP	48
51	118-1		GETCHELL & HAUSER 1E	119-1	300	21	VCP	48
52	119-1		GETCHELL & HAUSER IN	119-2	335	21	VCP	48
53	119-2		LYNDALE & GETCHELL 1E	117-2	251	15	RCP	48
54	158-1		13TH & LOGAN	117-1	283	8	VCP	48
55	158-2		12TH & LOGAN	158-1	360	8	VCP	48
56	159-1		11TH & LOGAN	159-1	359	8	VCP	48
57	159-18		11TH & LOGAN 1E	159-1	130	8	VCP	48
58	159-1L		11TH & LOGAN IS	159-1	390	8	VCP	48
59	171-1		LYNDALE & NORTH PARK	171-2	352	18	VCP	48
60	171-2		LYNDALE & KESSLER	119-2	274	15	VCP	48

	Record#	MANHOLE#	TYPE	LOCATION	PIPE SIZE	PIPE TYPE	AREACODE	MAIN RATE
61	172-2	172-4	GETCHELL & LYNDALE	IE IN	124	24 RCP	48	NR
62	172-3	172-2	LYNDALE & GETCHELL	ISE	48	15 RCP	48	NR
63	172-4	363-18	16TH & FRONT STREET	IW	325	21 RCP	48	NR
64	188-1	204-1	LAWRENCE & FULLER	PLACER & FULLER	525	21 VCP	48	NR
65	204-1	205-1	FULLER & PLACER	FULLER & NEILL	603	24 VCP	48	3
66	204-1L	204-1	PLACER & FULLER	PLACER & FULLER	215	8 VCP	48	NR
67	205-1	205-2	FULLER & NEILL	NEILL & FRONT	188	24 VCP	48	5
68	205-2	206-1	NEILL & FRONT	13TH & FRONT	550	24 VCP	48	NR
69	206-1	207-1	13TH & FRONT	14TH & FRONT	440	24 VCP	48	NR
70	206-1B	206-1	13TH & FRONT STREET	1E	252	8 VCP	48	NR
71	207-1	208-1	14TH & FRONT	15TH & FRONT	460	24 VCP	48	NR
72	208-1	433-1	15TH & FRONT ST	16TH & FRONT ST	225	24 VCP	48	NR
73	210-1	204-1	100 ALLEY PLACER	FULLER & PLACER	210	18 VCP	48	NR
74	210-1L	210-1	100 ALLEY PLACER 1S	100 ALLEY PLACER	227	8 VCP	48	NR
75	213-1	214-1	SANDERS & PHONE IX	HARRIS & PHOENIX	471	24 VCP	48	NR
76	245-1	051-1	12TH & RALEIGH	12TH & DAVIS	222	8 VCP	48	NR
77	245-1A	245-1	12TH & HOBACK 1W	12TH & RALEIGH	475	8 VCP	48	5
78	245-1L	245-1	12TH & RALEIGH 1S	12TH & RALEIGH	225	8 VCP	48	NR
79	245-3	250-1A	12TH & HOBACK 1E	12TH & IDAHO	390	8 VCP	48	5
80	250-1	066-1	12TH & DAKOTA	12TH & MONTANA	425	8 VCP	48	NR
81	250-1A	250-1	12TH & IDAHO	12TH & DAKOTA	451	8 VCP	48	3
82	260-1	260-2	12TH & IDAHO	12TH & LYNDALE	333	8 VCP	48	NR
83	260-2	260-3	JACKSON & LYNDALE	LYNDALE & WARREN	367	10 VCP	48	5
84	260-3	261-1	LYNDALE & LOGAN	EWING & LYNDALE	431	10 VCP	48	NR
85	261-1	262-1	WARREN & LYNDALE	BEDFORD & LYNDALE	585	10 VCP	48	NR
86	262-1	263-1	EDWARD & LYNDALE	DODGE & LYNDALE	332	12 VCP	48	NR
87	263-1	061-1	DODGE & LYNDALE	HELENA & MONTANA	342	12 VCP	48	NR
88	264-1	264-2	LYNDALE & LOGAN	LYNDALE & WARREN	545	8 VCP	48	5
89	264-1	264-2A	14TH & LOGAN	15TH & LOGAN 1S	250	8 VCP	48	NR
90	264-2	265-1	14TH & LOGAN	16TH & LOGAN	385	8 VCP	48	NR
91	264-2A	264-2	15TH & LOGAN 1S	15TH & LOGAN	170	8 VCP	48	NR
92	265-1	266-1	16TH & LOGAN	17TH & LOGAN	510	8 VCP	48	NR
93	266-1	260-2	14TH & LOGAN	LOGAN & EAST LYNDALE	184	8 VCP	48	NR
94	267-1T	267-2	14TH & LOGAN	16TH & WARREN	435	8 VCP	48	NR
95	267-2	268-1	16TH & LOGAN	17TH & WARREN	510	8 VCP	48	5
96	268-1	260-3	17TH & WARREN	LYNDALE & WARREN	362	8 VCP	48	NR
97	269-1	270-1	14TH & JACKSON	15TH & JACKSON	471	8 VCP	48	NR
98	269-1L	269-1	14TH & JACKSON 1E	14TH & JACKSON	180	8 VCP	48	NR
99	270-1	270-2	15TH & JACKSON	16TH & JACKSON	385	8 VCP	48	NR
100	270-2	260-1	16TH & JACKSON	LYNDALE & JACKSON	526	8 VCP	48	NR
101	278-1	062-2	MISSOURIA & DAKOTA	MISSOURIA & MONTANA	425	8 VCP	48	NR
102	279-1	278-1	MISSOURIA & IDAHO	MISSOURIA & DAKOTA	464	8 VCP	48	NR
103	280-1	279-1	MISSOURIA & HOBACK	MISSOURIA & IDAHO	460	8 VCP	48	NR
104	280-1L	280-1	MISSOURIA & HOBACK 1S	MISSOURIA & HOBACK	101	8 VCP	48	NR
105	283-2	119-2	HENRY & GETCHELL	LYNDALE & GETCHELL	280	8 VCP	48	NR
106	286-2	065-1	IDAHO & PROSPECT	IDAHO & PROSPECT	462	8 VCP	48	NR
107	284-2	284-2	IDAHO & PROSPECT	IDAHO & PROSPECT	424	8 VCP	48	NR
108	285-1T	284-1	HOBACK & PROSPECT 1E	IDAHO & PROSPECT	402	8 VCP	48	NR
109	286-1	286-2	IDAHO & BUTTE	IDAHO & BUTTE	402	8 VCP	48	NR
110	286-2	065-1	DAKOTA & BUTTE	BUTTE & MONTANA	424	8 VCP	48	NR
111	287-1T	286-1	BUTTE & HOBACK 1E	BUTTE & IDAHO	426	8 VCP	48	NR
112	299-1	262-1	RODNEY & BEDFORD 1E	BEDFORD & LYNDALE	372	8 VCP	48	NR
113	325-1	006-2	12TH & JACKSON	HELENA AVE & JACKSON	160	8 VCP	48	NR
114	325-1A	325-1	12TH & JACKSON 1S	12TH & JACKSON	282	8 VCP	48	NR
115	335-1	335-2	IDAHO & LIVINGSTON	LIVINGSTON & DAKOTA 1W	240	8 VCP	48	NR
116	335-2	335-3	LIVINGSTON & DAKOTA 1W	LIVINGSTON & DAKOTA 1W	268	8 VCP	48	NR
117	335-2L	335-2	TOWNSEND & LIVINGSTON 1E	LIVINGSTON & DAKOTA 1W	276	6 VCP	48	NR
118	335-3	060-2	LIVINGSTON & DAKOTA	LIVINGSTON & MONTANA	392	3 VCP	48	NR
119	339-1	339-2	BILLINGS & IDAHO 1E	BILLINGS & DAKOTA	424	8 VCP	48	2
120	339-2	062-1	BILLINGS & DAKOTA	BILLINGS & MONTANA	424	8 VCP	48	NR

Record#	MANHOLE#	UPSIDOR	DWNIDOR	PIPE TYPE	AREACODE	HA IN RATE
121	339-2L	BILLINGS & DAKOTA 1S		VCP	48	NR
122	342-2	HELENA & EWING IN	17TH & EWING	VCP	48	NR
123	342-2	17TH & EWING	LYNDALE & EWING	VCP	48	NR
124	348-1	PARK & HAUSER IS	PARK 3 HAUSER	VCP	48	NR
125	348-2	HAUSER & PARK	HAUSER & KESSLER 1E	VCP	48	NR
126	348-3	HAUSER & PARK IN	HAUSER & PARK	VCP	48	NR
127	348-4	HAUSER & KESSLER IW	HAUSER & KESSLER	VCP	48	NR
128	348-5	HAUSER & HAUSER	GETCHELL & KESSLER 1E	VCP	48	NR
129	348-6	KESSLER & HAUSER IN	KESSLER & HAUSER	VCP	48	NR
130	349-1	GETCHELL & STUART 2S	GETCHELL & STUART 1S	VCP	48	NR
131	349-2	GETCHELL & STUART IS	GETCHELL & STUART IN	VCP	48	NR
132	359-1	NEILL AVENUE & NORTH MAIN	13TH & NORTH MAIN	CPN	48	NR
133	359-2	13TH & NORTH MAIN	14TH & NORTH MAIN	CPN	48	NR
134	359-3	14TH & NORTH MAIN	15TH & NORTH MAIN	CPN	48	NR
135	359-4	15TH & MAIN 1W	15TH & MAIN 1W	CPN	48	NR
136	360-1	15TH & MAIN IW	15TH & FRONT ST	CPN	48	NR
137	433-1	16TH & FRONT	16TH & FRONT IN	CPN	48	NR
138	433-2	16TH & MAIN	16TH & FRONT ST 1E	VCP	48	NR
139	433-2L	16TH & MAIN 1E	16TH & MAIN 2E	VCP	48	NR
140	443-1A	16TH & NORTH MAIN	LYNDALE & MAIN	DIP	48	NR
141	443-1B	15TH & NORTH MAIN IN	16TH & NORTH MAIN	DIP	48	NR
142	001-6A	CUTLER & WEST MAIN 1W	CUTLER & WEST MAIN	CMT	58	1
143	002-1	BROADWAY & MALL 1S	BROADWAY & LAST CHANCE	VCP	58	5
144	002-2	BROADWAY & MALL	BROADWAY & MALL IN	VCP	58	5
145	002-3	EDWARDS & MALL	GRAND & MALL	RCP	58	NR
146	003-1	6TH & MAIN	6TH & FULLER	VCP	58	3
147	003-1	004-4	7TH & MAIN ST	VCP	58	NR
148	003-2	003-1	6TH & LAST CHANCE	VCP	58	NR
149	003-4	003-2	6TH & MALL 1S	VCP	58	5
150	004-1	004-2	7TH & JACKSON	PVC	58	5
151	004-1B	004-1	7TH & ALLEN IN	VCP	58	5
152	004-2	004-4	7TH & LAST CHANCE GUL	VCP	58	NR
153	004-3	005-3	PLACER & MAIN	VCP	58	3
154	004-3A	004-3	LAWRENCE & MAIN	VCP	58	NR
155	004-3B	004-2	LAWRENCE & LOGAN 1W	VCP	58	5
156	004-3C	004-3	LAWRENCE & LOGAN 1W	VCP	58	NR
157	004-4	004-3	LAWRENCE & MAIN	VCP	58	3
158	005-1	005-2	LAWRENCE & LAST CHANCE	VCP	58	NR
159	005-2	005-3	LAWRENCE & MAIN	VCP	58	5
160	017-1	002-2	MAIN & BROADWAY	CMT	58	NR
161	018-1	004-2	7TH & JACKSON	CMT	58	1
162	018-2	018-1	JACKSON & GRAND	CMT	58	NR
163	018-3	018-2	JACKSON STREET & GRAND ST	CMT	58	NR
164	018-3A	018-3	JACKSON STREET & GRAND 2W	CMT	58	NR
165	020-1	197-2	WARREN & STATE	CMT	58	NR
166	020-2	020-1	WARREN & CUTLER	CMT	58	NR
167	020-3	020-2	WARREN & PINE	VCP	58	NR
168	021-1	021-2	7TH & WARREN 2N 1E E	CMT	58	5
169	021-2	021-3A	7TH & WARREN 2N	CMT	58	NR
170	021-3	021-4	7TH & WARREN	CMT	58	NR
171	021-3A	021-3	7TH & WARREN IN	CMT	58	NR
172	021-3L	021-3	7TH & WARREN IW	CMT	58	NR
173	021-4	004-1	7TH & WARREN IW	CMT	58	NR
174	022-2	022-1	10TH & WARREN	PVC	58	5
175	022-3	022-2	9TH & WARREN	CMT	58	4
176	022-3T	022-3	9TH & WARREN IS	CMT	58	NR
177	025-1	020-2	EWING & STATE	CMT	58	NR
178	025-2	025-1	CUTLER & EWING	CMT	58	NR
179	026-1	120-1	BROADWAY & EWING	CMT	58	NR
180	026-1A	026-1	BROADWAY & EWING 1S	CMT	58	NR

Record#	MANHOLE#	UFSADDR	LENGTH	PIPE	TYPE	AREACODE	MAINRATE
131	026-2	EWING & MILLER IN	235	8	CMT	58	NR
132	026-2A	EWING & MILLER 2N	239	3	CMT	58	2
133	026-3	EWING & MILLER	250	3	CMT	58	NR
134	027-2	ROONEY & BRECKENRIDGE IN	291	8	CMT	58	NR
135	027-3	5TH & WEST EWING IS	362	9	CMT	58	1
136	027-4	5TH & WEST EWING IS	135	9	CMT	58	1
137	027-5	5TH & WEST EWING IS IE	75	9	CMT	58	NR
138	027-6	5TH & WEST EWING IS IE	150	9	CMT	58	NR
139	027-7	BRECKENRIDGE & ROONEY IW	200	8	CMT	58	NR
140	028-2	10TH & EWING	276	8	CMT	58	2
141	028-3T	9TH & EWING IN	217	8	CMT	58	NR
142	033-1	CLANCY & RODNEY	509	8	CMT	58	5
143	033-1A	CLANCY & SPARTA IE	550	8	VCP	58	NR
144	033-2	ROONEY & CLANCY	305	8	CMT	58	5
145	033-3	ROONEY & FLORA IN	242	8	CMT	58	5
146	034-1	ROONEY & PINE	435	8	CMT	58	5
147	035-1	ROONEY & STATE	489	9	CMT	58	5
148	036-1	ROONEY & MILLER IN	415	9	CMT	58	5
149	037-1	BROADWAY & ROONEY IS	226	8	CMT	58	NR
200	037-1A	400 ALLEY BROADWAY	438	6	VCP	58	NR
201	037-2	400 ALLEY BROADWAY IS	367	9	CMT	58	2
202	038-1	ROONEY & BROADWAY	266	9	CMT	58	4
203	038-2	5TH & ROONEY	268	9	CMT	58	4
204	039-1	ROONEY & BROADWAY	277	9	CMT	58	4
205	039-2	7TH & ROONEY	266	9	CMT	58	5
206	040-1	6TH & ROONEY	275	9	CMT	58	1
207	040-2	9TH & ROONEY	276	9	VCP	58	1
208	041-2	8TH & ROONEY	241	9	CMT	58	2
209	046-1	10TH & ROONEY IN	315	8	VCP	58	NR
210	046-2	7TH & ROONEY	314	8	VCP	58	NR
211	046-3	HIGHLAND & DAVIS	322	8	VCP	58	NR
212	046-4	STATE & SPENCER	316	6	VCP	58	NR
213	047-1	DAVIS & BROADWAY	296	9	VCP	58	3
214	047-2	DAVIS & BRECKENRIDGE	274	9	VCP	58	3
215	048-1	BRECKENRIDGE & DAVIS IW	224	8	CMT	58	1
216	048-2	5TH & DAVIS IW	227	8	CMT	58	1
217	048-3	5TH & DAVIS	50	9	VCP	58	5
218	048-4	6TH & DAVIS	267	9	VCP	58	5
219	048-5	6TH & DAVIS IN	226	9	VCP	58	3
220	049-1	8TH & DAVIS	269	9	VCP	58	5
221	049-2	7TH & DAVIS	278	9	VCP	58	3
222	049-3	7TH & DAVIS IW	252	9	CMT	58	NR
223	049-4	6TH & DAVIS IN (GHOST MH)	48	8	CMT	58	1
224	050-2	9TH & DAVIS IN	361	12	VCP	58	5
225	050-3	9TH & DAVIS IS	240	12	VCP	58	1
226	055-1	BLAKE & HIGHLAND	269	8	CMT	58	NR
227	055-2	STATE & BLAKE	421	8	CMT	58	5
228	055-2	BLAKE & STATE	273	8	CMT	58	1
229	055-3	3RD & BLAKE	271	8	CMT	58	1
230	056-1	HILLSDALE & BLAKE	340	8	CMT	58	1
231	057-1	CHAUCER & HILLSDALE	271	9	VCP	58	5
232	057-2	CHAUCER & STATE	271	9	VCP	58	1
233	057-3	3RD & CHAUCER	270	9	CMT	58	NR
234	058-1	BROADWAY & CHAUCER	450	9	VCP	58	NR
235	058-2	CHAUCER & HILLSDALE	270	9	VCP	58	NR
236	059-1	5TH & K STREET IE	171	15	VCP	58	5
237	059-2	BRECKENRIDGE & K ST IE	271	15	VCP	58	NR
238	059-3	BROADWAY & STABERN	269	15	VCP	58	NR
239	071-1	PARK & CRUISE 2N	70	10	PVC	58	NR
240	071-2	PARK & CRUISE IN	300	9	CMT	58	NR

Record#	MANHOLE#	UPNADDOR	DNWADDOR	PIPE TYPE	SIZE	AREACODE	MAINRATE
241	071-2	CRUSE & PARK 2S	CRUSE & PARK IS	325	9	CMT	58
242	073-1	502 WEST MAIN IS	BY CRUSE & PARK 2S	487	6	CMT	58
243	073-2	502 WEST MAIN ST	CRUSE & PARK 2S	502	6	CMT	58
244	074-1	600 BLK & WEST MAIN	600 WEST MAIN	365	6	CMT	58
245	074-2	600 BLOCK WEST MAIN IN	500 BLOCK WEST MAIN	485	6	CMT	58
246	075-1T	LAST MANHOLE ON SOUTH MAIN	600 BLOCK WEST MAIN	400	6	CMT	58
247	076-1T	REEDERS ALLEY & S PARK 2S	REEDERS ALLEY & S PARK IS	361	8	CMT	58
248	076-2	REEDERS ALLEY & S PARK 1S	REEDERS ALLEY & S PARK	216	8	CMT	58
249	076-3	REEDERS ALLEY & S PARK	REEDERS ALLEY & S PARK	210	8	CMT	58
250	076-4	REEDERS ALLEY & SOUTH PARK IN	SOUTH PARK & WONG 1N	415	8	CMT	58
251	077-1	SOUTH PARK & WONG IN	SOUTH PARK & WONG 2N	324	9	CMT	58
252	077-1L	SOUTH PARK & WONG 1E	SOUTH PARK & WONG IN	190	8	CMT	58
253	078-1	EDWARDS & PARK	EDWARDS & MALL SITE	320	10	CMT	58
254	078-2	SOUTH PARK & EDWARDS 1S	SOUTH PARK & EDWARDS	275	9	CMT	58
255	079-1	PARK & CLARKE 1S	PARK & CLARKE	145	9	CMT	58
256	079-2	PARK & CLARKE	PARK & LAWRENCE	420	9	CMT	58
257	079-3	PARK & CLARKE	EDWARDS & PARK	206	9	VCP	58
	258	EDWARDS & PARK IN	LAWRENCE & FULLER	317	12	VCP	58
	259	LAWRENCE & PARK	PARK & PLACER	557	9	CMT	58
	260	PARK & LAWRENCE	BENTON & EDWARDS	406	8	CMT	58
	261	BENTON & ADAMS	BENTON & ADAMS	242	8	CMT	58
	262	ADAMS & BENTON 1S	EDWARDS & PARK	324	8	CMT	58
	263	EDWARDS & BENTON IN	BENTON & EDWARDS IN	246	8	CMT	58
	264	BENTON & CLARKE	PARK & CLARKE	250	9	VCP	58
	265	CLARKE & BENTON	LAWRENCE & BENTON	393	9	CMT	58
	266	BENTON & EDWARDS 1N	BENTON & CLARKE	211	8	CMT	58
	267	080-1	LAWRENCE & PARK	260	9	VCP	58
	268	092-1	BENTON & CLARKE	282	8	CMT	58
	269	092-1	LAWRENCE & BENTON	374	9	VCP	58
	270	092-1L	JEFFERSON & ADAMS	418	6	CMT	58
	271	093-1	JEFFERSON & ADAMS 1S	277	9	VCP	58
	272	093-2	MING & OLIVE	55	9	VCP	58
	273	094-1	OLIVE & MING 1S	454	9	VCP	58
	274	094-1L	OLIVE & WASHINGTON 1W	200	8	VCP	58
	275	094-3	OLIVE & WASHINGTON 1W	141	12	VCP	58
	280	097-1	CLARKE & OLIVE	271	8	CMT	58
	276	095-1	ADAMS & HOWIE	325	8	CMT	58
	277	095-1L	ADAMS & HOWIE	390	9	VCP	58
	278	095-2T	ADAMS & HOWIE 1S	253	6	CMT	58
	279	096-1	MING & HOWIE	548	9	VCP	58
	280	097-1	CLARK & HOWIE	406	9	VCP	58
	281	097-1	HOWIE & CLARK	325	8	CMT	58
	282	115-1	SHILAND & BROADWAY S	330	8	CMT	58
	283	115-2	BROADWAY & SHILAND	300	9	VCP	58
	284	120-1	WARREN & BROADWAY	349	8	CMT	58
	285	120-2T	WARREN & BROADWAY 1S	330	8	CMT	58
	286	121-1	BROADWAY & RODNEY 1W	293	8	CMT	58
	287	122-1	BROADWAY & DAVIS 1E	238	8	CMT	58
	288	122-2	BROADWAY & CHAUSER 1W	275	8	CMT	58
	289	123-1	BROADWAY & BEATTIE	456	9	VCP	58
	290	124-1	BROADWAY & RALEIGH	268	9	VCP	58
	291	125-1	BROADWAY & HOBACK	276	9	VCP	58
	292	125-1L	BROADWAY & HOBACK 1S	334	8	CMT	58
	293	126-1	BROADWAY & ALTA	266	9	VCP	58
	294	126-1L	ALTA & HIGHLAND	350	8	VCP	58
	295	127-1	400 ALLEY NORTH WARREN	140	8	PVC	58
	296	127-2T	400 ALLEY NORTH WARREN 1E	247	8	CMT	58
	297	127-3	WARREN & BRECKENRIDGE	133	8	PVC	58
	298	127-4	BRECKENRIDGE & WARREN	302	8	PVC	58
	299	128-1	BRECKENRIDGE & DAVIS	357	8	CMT	58
	300	128-2	BRECKENRIDGE & GEM 2W	243	8	CMT	58

Record#	MANHOLE#	UPSIDOR	DNNAODR	LENGTH	PIPE TYPE	SIZE	AREACODE	MATERIAL
301	129-1	BRECKENRIDGE & BEATTIE IW	BRECKENRIDGE & BEATTIE	256	8 VCP	58		NR
302	129-2	BRECKENRIDGE & BEATTIE	BRECKENRIDGE & RALEIGH	469	9 CMT	58		1
303	129-3	BRECKENRIDGE & RALEIGH	BRECKENRIDGE & HOBAK IW	462	9 CMT	58		1
304	130-1	BRECKENRIDGE & HOBAK IW	BRECKENRIDGE & ALTA	376	9 CMT	58		3
305	131-1	BRECKENRIDGE & ALTA	BRECKENRIDGE & ALTA IE	268	9 CMT	58		4
306	132-1	6TH & ALLEN	6TH & JACKSON	137	8 CMT	58		1
307	132-3	5TH & WARREN	6TH & WARREN	275	8 PVC	58		5
308	133-1	5TH & GEM IW	5TH & DAVIS IN	378	8 CMT	58		1
309	133-2T	5TH & BEATTIE IW	5TH & GEH IW	341	8 CMT	58		NR
310	134-1	5TH & BEATTIE IE	5TH & RALEIGH IW	220	8 CMT	58		1
311	134-1A	5TH & RALEIGH IW	5TH & RALEIGH IE	315	8 CMT	58		NR
312	134-2	5TH & RALEIGH IE	5TH & HOBACK	445	8 CMT	58		1
313	135-1	5TH & HOBACK	5TH & K STREET	338	8 CMT	58		4
314	136-1	5TH & K STREET	5TH & K STREET IE	214	9 CMT	58		5
315	136-2	5TH & K STREET 2E	6TH & K STREET 1E	267	15 VCP	58		NR
316	137-1T	6TH & FULLER IW	6TH & FULLER AVE.	288	8 CMT	58		NR
317	137-2	6TH & FULLER AVE.	LAWRENCE & FULLER	490	21 VCP	58		1
318	138-1	6TH & WARREN	6TH & ALLEN	320	8 CMT	58		1
319	138-2	6TH & EWING	6TH & WARREN	356	8 CMT	58		1
320	139-1T	6TH & EWING IE	6TH & EWING IW	315	8 CMT	58		NR
321	139-2T	6TH & DAVIS IW	6TH & DAVIS	257	9 CMT	58		NR
322	140-1	6TH & DAVIS 2E	6TH & DAVIS IN (GHOST MH)	234	8 CMT	58		NR
323	140-2T	6TH & BEATTIE IW	6TH & DAVIS 2E	280	8 CMT	58		NR
324	141-1T	6TH & BEATTIE IE	6TH & RALEIGH	407	8 CMT	58		NR
325	142-1	6TH & RALEIGH	6TH & HOBACK	568	8 CMT	58		4
326	142-2	6TH & HOBACK	6TH & K STREET	336	9 CMT	58		4
327	143-1	6TH & K STREET	6TH & K STREET 1E	383	9 CMT	58		1
328	143-2	6TH & K IE	6TH & K IE IN	170	15 VCP	58		NR
329	144-1	7TH & WARREN IE	7TH & WARREN	281	8 CMT	58		1
330	144-2	8TH & WARREN IS	7TH & WARREN IN	30	9 CMT	58		1
331	144-3T	300 ALLEY EWING IW	300 ALLEY WARREN IE	285	9 CMT	58		NR
332	145-1	8TH & RODNEY IW	8TH & RODNEY	215	8 CMT	58		1
333	145-2	8TH & RODNEY IE	8TH & RODNEY	337	8 CMT	58		1
334	146-1	8TH & BEATTIE	8TH & DAVIS	391	8 CMT	58		2
335	146-1L	8TH & BEATTIE IS	8TH & BEATTIE	320	8 VCP	58		NR
336	147-1	8TH & RALEIGH IW	8TH & BEATTIE	405	8 CMT	58		1
337	148-1	8TH & RALEIGH IE	8TH & HOBACK	498	9 CMT	58		2
338	148-2	8TH & HOBACK	8TH & IDAHO	459	9 CMT	58		4
339	149-1	8TH & IDAHO	8TH & DAKOTA IW	364	9 CMT	58		4
340	150-1	8TH & DAKOTA IW	8TH & DAKOTA IN	207	15 VCP	58		NR
341	151-1	9TH & EWING	9TH & WARREN	366	8 CMT	58		4
342	151-2T	9TH & EWING IE	9TH & EWING	285	8 CMT	58		NR
343	151-3	400 ALLEY WARREN IE	9TH & WARREN IS	20	9 CMT	58		NR
344	151-4	400 ALLEY EWING IW	400 ALLEY WARREN IE	297	8 CMT	58		1
345	151-5T	400 ALLEY ROONEY	400 ALLEY EWING IW	325	8 CMT	58		NR
346	152-1	9TH & BEATTIE	9TH & BEATTIE	192	9 CMT	58		NR
347	152-1L	152-1	9TH & BEATTIE IS	154	6 VCP	58		NR
348	152-2T	152-1	9TH & BEATTIE IE	406	8 CMT	58		NR
349	153-1T	153-2	9TH & BEATTIE IE	491	8 CMT	58		NR
350	153-2	154-1	9TH & HOBACK	469	8 CMT	58		1
351	154-1	155-1	9TH & IDAHO	455	8 CMT	58		1
352	155-1	164-1	9TH & DAKOTA	366	21 VCP	58		NR
353	156-1T	10TH & RODNEY IW	10TH & EWING	276	8 CMT	58		NR
354	157-1	300 ALLEY 7TH	300 ALLEY 8TH	274	8 CMT	58		1
355	157-1L	157-1	300 ALLEY 7TH	85	6 CPN	58		NR
356	157-2	157-1	300 ALLEY 6TH	220	8 CMT	58		NR
357	160-1T	162-1	11TH & WARREN	294	9 CMT	58		NR
358	161-2	162-1	11TH & RALEIGH IW	357	8 CMT	58		1
359	162-1	162-2	11TH & RALEIGH IE	495	8 CMT	58		4
360	162-2	163-1	11TH & HOBACK	468	9 CMT	58		1

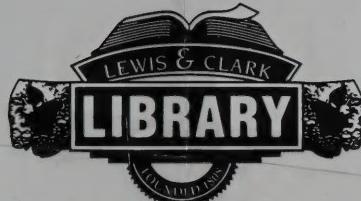
Record#	MANHOLE#	OWNER/ADDR	LENGTH	PIPE/TYPE	SIZE	AREACODE	MAINRTE
361	163-1	11TH & IDAHO	452	9 CMT	58	3	NR
362	164-1	11TH & DAKOTA	425	18 VCP	58	58	NR
363	164-2	HARRISON & CLARKE IN	200	8 CMT	58	2	1
363	189-1T	HARRISON & CLARKE 1W	267	8 CMT	58	1	1
364	189-2T	HARRISON & CLARKE 1W	467	8 CMT	58	1	NR
365	189-3	HARRISON & CLARKE 1W	351	9 VCP	58	1	NR
366	191-1	HARRISON & CLARKE	119	6 VCP	58	NR	NR
367	191-2T	MING & OLIVE	265	8 CMT	58	1	NR
368	193-1T	EDWARDS & BENTON	222	8 CMT	58	NR	NR
369	195-1T	ADAMS & HARRISON	213	8 CMT	58	NR	NR
370	195-2T	HIGHLAND & BLAKE	147	12 PVC	58	NR	NR
371	197-2	HIGHLAND & CHAUCER	216	8 CMT	58	1	NR
372	198-1T	NE CORNER ANDERSON APTS	45	8 CMT	58	1	NR
373	198-2	EDWARD & RODNEY 2W	310	8 CMT	58	1	NR
374	198-2A	EDWARD & RODNEY 2W	350	8 CMT	58	1	NR
375	198-3	EWING & STATE	208	8 CMT	58	1	NR
376	200-1	REEDERS ALLEY & FRONTIER PARK	200	8 PVC	58	NR	NR
377	200-1A	REEDERS ALLEY & BENTON TRAIL	59	6 PVC	58	NR	NR
378	200-1B	REEDERS ALLEY & HOWIE BRIDGE	219	8 CMT	58	1	NR
379	201-2	REEDERS ALLEY & HOWIE ST BRIDGE 1S	150	8 CMT	58	5	NR
380	201-2A	WARRAN & PINE 1W	376	8 CMT	58	1	NR
381	202-1	CUTLER & RODNEY 1W	228	8 CMT	58	1	NR
382	202-2	EWING & PINE	366	8 CMT	58	2	NR
383	202-3	EWING & PINE 1W	276	8 CMT	58	2	NR
384	218-1	BROADWAY & RALEIGH 1S	265	8 CMT	58	1	NR
385	219-1	HILLSDALE & BLAKE 1E	172	8 CMT	58	NR	NR
386	219-2T	HILLSDALE & CHAUCER 1W	240	6 CMT	58	NR	NR
387	221-1T	EDWARDS & BENTON 1E 2S	100	8 CMT	58	2	NR
388	221-2	EDWARDS & BENTON 1E 2S	190	8 CMT	58	NR	NR
389	221-2A	EDWARDS & BENTON 1E 1S	212	15 VCP	58	NR	NR
390	222-1	EDWARDS & BENTON 1E 1S	184	15 VCP	58	NR	NR
391	223-1	6TH & K 1E IN	195	8 CMT	58	NR	NR
392	229-1	9TH & DAKOTA 1S	294	8 VCP	58	NR	NR
393	229-1A	CLANCY & SPENCER 1S	159	8 VCP	58	NR	NR
394	229-2	CLANCY & SPENCER 1S	352	8 VCP	58	5	NR
395	229-3	CLANCY & SPENCER	188	8 VCP	58	5	NR
396	230-1	PINE & SPENCER	61	8 VCP	58	NR	NR
396	230-1A	STATE & DAVIS 1E	270	8 VCP	58	5	NR
397	230-1A	STATE & BLAKE 2W	180	8 VCP	58	NR	NR
398	230-2	STATE & BLAKE 1W	514	8 VCP	58	NR	NR
399	231-1	8TH & MONTANA	270	8 VCP	58	NR	NR
400	233-1	1ST & BEATTIE	277	8 VCP	58	NR	NR
401	233-1B	RHODE ISLAND & BEATTIE	90	8 VCP	58	NR	NR
402	233-1L	1ST & BEATTIE 1E	270	8 VCP	58	5	NR
403	233-2	2ND & BEATTIE	488	8 CMT	58	3	NR
404	233-3	3RD & BEATTIE	270	8 VCP	58	NR	NR
405	233-3	3RD & BEATTIE	270	8 VCP	58	3	NR
407	234-1	HIGHLAND & BEATTIE IN	124	8 VCP	58	NR	NR
408	234-2	HIGHLAND & BEATTIE 1S	267	8 VCP	58	NR	NR
409	234-2L	HIGHLAND & BEATTIE 1E	37	8 VCP	58	NR	NR
410	234-3	BEATTIE & STATE	250	8 VCP	58	3	NR
411	234-3L	BEATTIE & STATE 1E	270	8 VCP	58	NR	NR
412	235-1	BEATTIE & HILLSDALE	200	8 VCP	58	NR	NR
413	235-1L	HILLSDALE & BEATTIE 1E	401	8 VCP	58	NR	NR
414	237-1	1ST & BEATTIE 1E	426	8 VCP	58	NR	NR
415	238-1	2ND & CHAUCER	450	8 VCP	58	5	NR
416	238-1L	2ND & CHAUCER 1W	120	8 VCP	58	3	NR
417	238-2	2ND & RALEIGH	488	8 VCP	58	3	NR
418	238-2B	2ND & RALEIGH 1S	196	8 VCP	58	NR	NR
419	238-2L	2ND & RALEIGH 1E	77	8 VCP	58	NR	NR
420	239-1	3RD & BEATTIE 1E	300	8 VCP	58	NR	NR

	Record#	MANHOLE#	LENGTH	SIZE	PIPE TYPE	AREACODE	MAIN RATE
UPSDOR	421	239-IL	239-1	3RD & BEATTIE 2E	50	8 VCP	58 NR
	422	241-1	057-1	HIGHLAND & CHAUCER 1E	50	8 VCP	58 3
	423	242-1	235-1	HILLSDALE & CHAUCER 1E	400	8 VCP	58 3
	424	244-1	136-2	5TH & MONTANA 1W	400	8 VCP	58 NR
	425	248-1	155-1	9TH & MONTANA	614	8 VCP	58 NR
	426	249-1	155-1	10TH & IDAHO	419	8 VCP	58 NR
	427	249-1A	249-1	10TH & HOBACK	344	8 VCP	58 NR
	428	252-1A	252-1A	HARRISON & MING IN	498	8 VCP	58 5
	429	252-1A	189-3	HARRISON & MING 2N	350	8 VCP	58 NR
	430	289-1	289-2	CLARKE & HARRISON 1E	100	8 VCP	58 5
	431	289-2	046-3	3RD & DAVIS IN	325	8 VCP	58 NR
	432	289-2A	289-2	DAVIS & STATE	150	8 VCP	58 NR
	433	289-2B	289-2A	3RD & DAVIS IN	176	8 VCP	58 NR
	434	289-2C	289-2B	3RD & DAVIS 1E	345	8 VCP	58 NR
	435	290-1	059-3	BROADWAY & DAKOTA	310	8 VCP	58 NR
	436	290-2	290-1	BROADWAY & MONTANA 1W	397	8 VCP	58 NR
	437	311-1	046-2	HIGHLAND & DAVIS 1E	344	8 VCP	58 NR
	438	311-2	311-1	HIGHLAND & BLAKE 1W	61	8 VCP	58 NR
	439	318-1	229-1	SPENCER & FLORA 1E	343	8 VCP	58 NR
	440	318-2	318-1	FLORA & SPENCER IS	139	8 PVC	58 NR
	441	318-3	318-1	FLORA & SPENCER 1W	245	8 PVC	58 NR
	442	319-IL	057-3	3RD & CHAUCER 1W	98	8 PVC	58 NR
	443	336-1	033-3	RODNEY & DIVISION	420	8 VCP	58 NR
	444	336-2T	336-1	RODNEY & DIVISION 1S	446	8 VCP	58 3
	445	336-3	336-1	DIVISION & SPARTA	54	8 CPN	58 NR
	446	337-1T	337-1	3RD & DAKOTA IN	364	8 CMT	58 NR
	447	337-2	337-3	DAKOTA & STATE	213	8 VCP	58 NR
	448	337-3	337-3A	DAKOTA & HIGHLAND 1E	271	9 VCP	58 NR
	449	337-3A	290-1	DAKOTA & HIGHLAND IN	150	8 VCP	58 NR
	450	337-4	337-5	DAKOTA & BROADWAY	402	8 VCP	58 NR
	451	337-4L	337-4	HIGHLAND & MONTANA 2W	138	10 CPN	58 NR
	452	337-5	337-3	1100 ALLEY HIGHLAND 1W	92	10 CPN	58 NR
	453	337-6L	337-5	1100 ALLEY HIGHLAND 1W	280	3 VCP	58 NR
	454	355-1	143-2	DAKOTA & HIGHLAND	94	8 VCP	58 NR
	455	355-1A	355-1	DAKOTA & HIGHLAND 1E	225	8 VCP	58 5
	456	357-1	059-2	BRECKENRIDGE & MONTANA 1W	323	9 VCP	58 NR
	457	357-2	357-1	BRECKENRIDGE & MONTANA 1E	470	8 VCP	58 3
	458	426-1	426-2	BRECKENRIDGE & MT 2W	200	8 VCP	58 NR
	459	426-2	120-1	100 ALLEY NORTH WARREN 1E	272	8 PVC	58 NR
	460	449-3	290-4	100 ALLEY NORTH WARREN	145	8 PVC	58 NR
	461	480-1	449-3	MONTANA & HIGHLAND	202	8 CPN	58 NR
	462	480-2	480-1	MONTANA & WINNE 1N	400	8 CPN	58 NR
	463	480-2L	480-2	SOUTH MONTANA & WINNE 1S	400	8 CPN	58 NR
	464	525-1	059-3	SOUTH MONTANA & WINNE 1S	63	8 CPN	58 NR
	465	525-2	525-3	STABERN & BROADWAY 1S	400	8 VCP	58 NR
	466	525-2L	525-2	ALTA & HIGHLAND	233	8 VCP	58 NR
	467	525-3	525-1	HIGHLAND & ALTA 1W	222	8 PVC	58 NR
	468	525-3L	525-3	STABERN & HIGHLAND 1E	161	8 VCP	58 NR
	469	525-4	525-3	STABERN & HIGHLAND 1S	228	8 VCP	58 NR
	470	525-4L	525-4	200 ALLEY STABERN 1W	129	8 VCP	58 NR
	471	525-4L2	525-4	200 ALLEY STABERN 1E	63	8 VCP	58 NR
	472	542-1	542-2	DAVIS & FLORA	228	8 VCP	58 NR
	473	542-2	289-1	1ST & DAVIS 1ST	397	9 CPN	58 NR
	474	542-2	542-2A	1ST & DAVIS ST	487	8 RCP	58 NR
	475	542-2A	289-1	PINE & DAVIS ST	330	8 VCP	58 NR
	476	542-3	542-2	1ST & DAVIS 1E	170	8 VCP	58 NR
	477	542-3A	542-3	STABERN & CHAUCER 1E	288	8 CPN	58 NR
	478	542-4	057-2	STATE & CHAUCER 1E	61	8 CPN	58 NR
	479	542-5	241-1	STATE & BEATTIE 2W	85	8 VCP	58 NR
	480	542-6	237-1	IST & CHAUCER 1E	250	8 VCP	58 NR

Record#	MANHOLE#	OWNER	ST & CHAUCER	W	PIPE TYPE	SIZE	LENGTH	MAINCODE	AREACODE	MAIN RATE
481	542-6L	UPSADOR	MALL & WONG	WEST MALL & WONG IS	WOODBRIDGE & MONTANA 2W	1S	30	CPN	58	NR
482	P70-19-1	002-1	WEST MALL & WONG	WEST MALL & WONG 1S	WOODBRIDGE & MONTANA 2W	1S	256	VCP	58	3
483	P70-19-2	P70-19-1	WEST MALL & WONG 2S	WEST MALL & WONG 1S	WOODBRIDGE & MONTANA 2S	1S	225	VCP	58	5
484	P70-19-3	P70-19-2	PUBLIC LIBRARY SW CORNER	WEST MALL & WONG 1S	WOODBRIDGE & MONTANA 2S	1S	166	VCP	58	NR
485	P70-19-5	P70-19-3	FEDERAL BLDG ACCESS ROAD	PUBLIC LIBRARY SW CORNER	WOODBRIDGE & MONTANA 2S	1S	102	CMT	58	4
486	P70-19-6	P70-19-5	FED BLDG ACCESS RD 1E	FED BLDG ACCESS RD	WOODBRIDGE & MONTANA 2S	1S	205	CMT	58	NR
487	P70-19-6A	P70-19-5	PUBLIC LIBRARY SW CORNER 1W	PUBLIC LIBRARY SW CORNER	WOODBRIDGE & MONTANA 2S	1S	44	VCP	58	NR
488	P70-19-7	P70-19-5	NW CORNER FEDERAL BUILDING 1S	NW CORNER FEDERAL BUILDING	WOODBRIDGE & MONTANA 2W	1S	105	CMT	58	NR
489	P75-11-1	P75-11-2	NW CORNER FEDERAL BUILDING	NW CORNER FEDERAL BUILDING	WOODBRIDGE & MONTANA 2W	1S	58	PVC	58	NR
490	P75-11-2	P70-19-6	MONTANA & OCEOLA	MONTANA & OCEOLA	WOODBRIDGE & MONTANA 2W	1S	29	PVC	58	NR
491	S1331-1	480-2A	WOOD BRIDGE & MONTANA 2W	WOOD BRIDGE & MONTANA 2W	WOODBRIDGE & MONTANA 2W	1S	126	PVC	58	NR
492	S1331-10	S1335-9	MONTANA & STRAWBERRY 4W	MONTANA & STRAWBERRY 4W	WOODBRIDGE & MONTANA 2W	1S	189	PVC	58	NR
493	S1331-11	S1331-10	S1331-11	MONTANA & STRAWBERRY 3W	WOODBRIDGE & MONTANA 2W	1S	109	PVC	58	NR
494	S1331-12	S1331-11	S1331-10	MONTANA & WOOD 2W	WOODBRIDGE & MONTANA 2W	1S	230	PVC	58	NR
495	S1331-13	S1331-12	S1331-11	MONTANA & WOOD BRIDGE 1S	WOODBRIDGE & MONTANA 2W	1S	155	PVC	58	NR
496	S1331-14	S1331-13	S1331-13	MONTANA & WOOD BRIDGE 2W	WOODBRIDGE & MONTANA 2W	1S	160	PVC	58	NR
497	S1331-15	S1331-15	S1331-15	MONTANA & WINTERGREEN 1S	WOODBRIDGE & MONTANA 2S	1S	204	PVC	58	NR
498	S1331-15A	S1331-15	S1331-15	MONT & WINTERGREEN CRT 1W	WINTERGREEN CRT & MONT 1W	1S	161	PVC	58	NR
499	S1331-16	S1331-15	S1331-15	MONTANA & WINTERGREEN	WINTERGREEN 1W	1S	142	PVC	58	NR
500	S1331-17	S1331-16	S1331-16	MONTANA & WOODBRIDGE	MONTANA & WINTERGREEN 1W	1S	375	PVC	58	NR
501	S1331-18	S1331-17	S1331-17	MONTANA & STRAWBERRY	MONTANA & WOODBRIDGE 2N	1S	171	PVC	58	NR
502	S1331-19	S1331-18	S1331-18	MONTANA & WINTERGREEN	MONTANA & WOODBRIDGE IN	1S	153	PVC	58	NR
503	S1331-2	S1331-19	S1331-19	OCEOLA & MONTANA 1W	MONTANA & WINTERGREEN IN	1S	125	PVC	58	NR
504	S1331-20	S1335-19	S1335-19	MONTANA & STRAWBERRY 2W	MONTANA & WINTERGREEN IN	1S	237	PVC	58	NR
505	S1331-21	S1331-20	S1331-20	MONTANA & STRAWBERRY 3W	MONTANA & WINTERGREEN 2W	1S	280	PVC	58	NR
506	S1331-23	S1335-18	S1335-18	MONTANA & STRAWBERRY 1W	MONTANA & WINTERGREEN 2W	1S	338	PVC	58	NR
507	S1331-24	S1331-24	S1331-24	BLOCK B LOT 12	BLOCK B LOT 9	1S	87	PVC	58	NR
508	S1331-25	S1331-24	S1331-24	BLOCK A & LOT 15	BLOCK A & LOT 12	1S	220	PVC	58	NR
509	S1331-26	S1331-25	S1331-25	OCEOLA & MONTANA 2W	BLOCK B & MONTANA 1W	1S	160	PVC	58	NR
510	S1331-27	S1331-26	S1331-26	OCEOLA & MONTANA 3W	BLOCK B & LOT 6	1S	218	PVC	58	NR
511	S1331-28	S1331-27	S1331-27	TOUCHSTONE DRIVE 2N	TOUCHSTONE DRIVE 3N	1S	189	PVC	58	NR
512	S1331-29	S1331-28	S1331-28	TOUCHSTONE DRIVE IN	TOUCHSTONE DRIVE 2N	1S	133	PVC	58	NR
513	S1331-3	S1331-29	S1331-29	WINTERGREEN COURT 1N	TOUCHSTONE DRIVE IN	1S	180	PVC	58	NR
514	S1331-30	S1331-29	S1331-29	TOUCHSTONE DRIVE	TOUCHSTONE DRIVE IN	1S	52	PVC	58	NR
515	S1331-4	S1331-3	S1331-3	WINTERGREEN COURT 1N	TOUCHSTONE DRIVE 3N	1S	158	PVC	58	NR
516	S1331-4A	S1331-3	S1331-3	WINTERGREEN COURT 1N	WINTERGREEN & MONT IN	1S	125	PVC	58	NR
517	S1331-5	S1331-4A	S1331-4A	WINTERGREEN COURT	WINTERGREEN & MONT IN	1S	170	PVC	58	NR
518	S1331-6	S1331-5	S1331-5	THE BRIDGE ON WOOD BRIDGE IN	WINTERGREEN DRIVE S	1S	204	PVC	58	NR
519	S1331-6A	S1331-6	S1331-6	WINTERGREEN COURT 1S	THE BRIDGE ON WOOD BRIDGE IN	1S	313	PVC	58	NR
520	S1331-6B	S1331-6A	S1331-6	MONTANA & WOOD BRIDGE 1W	TIMBER BRIDGE IN	1S	100	PVC	58	NR
521	S1331-7	S1331-6B	S1331-6	MONTANA & WOOD BRIDGE 1W	LOT 9 & BLOCK G	1S	250	PVC	58	NR
522	S1331-8	S1331-7	S1331-7	WOODBRIDGE & MONT 1W	TS-8 & WOODBRIDGE IN	1S	89	PVC	58	NR
523	S1331-9	S1331-8	S1331-8	MONTANA & WOODBRIDGE 2S	MONTANA & WOODBRIDGE 1S	1S	407	PVC	58	NR
524	U71-0-3	U71-0-4	U71-0-4	CRUSE AVENUE OVERPASS 1E	CRUSE AVENUE OVERPASS	1S	255	PVC	58	NR
525	U71-0-4	U71-0-3	U71-0-3	CRUSE AVENUE OVERPASS 1E	PARK W OF CRUSE AVE OVERPASS	1S	181	PVC	58	NR
526	U71-0-5	U71-0-4	U71-0-4	CUTLER & CRUSE AVE PARKWAY	CUTLER & CRUSE AVE PARKWAY IN	1S	260	PVC	58	NR
527	U71-0-6	U71-0-5	U71-0-5	CRUSE AVE & CUTLER PARKWAY	CRUSE AVENUE OVERPASS IS	1S	160	PVC	58	NR
528	U71-0-7	U71-0-6	U71-0-6	CRUSE AVE & CUTLER PARKWAY	CRUSE & CUTLER PARKWAY	1S	168	PVC	58	NR
529	U71-0-8	P70-19-2	P70-19-2	WEST YARD OF 101-109 S EWING	WONG & WEST MALL 1S	1S	225	VCP	58	NR
530	UR74-13-1	003-2	6TH & MALL 1E	6TH & MALL 1S	6TH & MALL 1S	1S	27	PVC	58	NR
531	UR74-13-2	UR74-13-1	6TH & MALL 1W	6TH & MALL 1E	6TH & MALL 1S	1S	157	PVC	58	NR
532	UR74-13-4	003-2	FLOWERIE & BENTON	STUART & BENTON	STUART & BENTON	1S	27	PVC	58	NR
533	083-1	090-2	LAWRENCE & BENTON	HOLTER & BENTON	HOLTER & BENTON	1S	231	VCP	68	NR
534	087-1	088-2	POWER & BENTON	GILBERT & BENTON	GILBERT & BENTON	1S	493	VCP	68	NR
535	088-1	089-2	POWER & BENTON	POWER & BENTON	POWER & BENTON	1S	382	VCP	68	5
536	088-2	088-1	HOLTER & BENTON	FLOWERIE & BENTON	FLOWERIE & BENTON	1S	380	VCP	68	5
537	089-1	089-1	GILBERT & BENTON	FLOWERIE & BENTON	FLOWERIE & BENTON	1S	138	VCP	68	NR
538	089-2	089-1	STUART & BENTON	HAUSER & BENTON	HAUSER & BENTON	1S	213	VCP	68	NR
539	090-2	090-3	HAUSER & BENTON	KNIGHT & BENTON	KNIGHT & BENTON	1S	370	CMT	68	9
540	090-3	091-2				1S	367	CMT	68	4

Record#	MANHOLE#	UPSADDR	Pipe Type	Length	Size	Area/Code	MainRate
541	091-1	KNIGHT & BENTON	VCP	225	24	LYNDALE & BENTON	NR
542	098-1	HOWIE & LAWRENCE	VCP	175	9	DEARBORN & LAWRENCE	5
543	099-1	100-2	CNT	307	3	300 ALLEY POWER	1
544	099-2T	099-1	CNT	367	6	300 ALLEY HOLTER	NR
545	100-1	101-1	CNT	515	8	300 ALLEY STUART	68
546	100-2	100-1	CNT	380	8	300 ALLEY GILBERT	68
547	101-1	102-2	CNT	372	3	300 ALLEY HAUSER	68
548	102-1	091-2	CNT	40	9	KNIGHT & BENTON	68
549	102-2	102-1	CNT	370	9	300 ALLEY KNIGHT	68
550	103-1	104-2	CNT	380	3	POWER & DEARBORN	68
551	103-2T	103-1	CNT	326	3	HOLTER & DEARBORN	68
552	104-1	105-2	CNT	213	8	FLOWeree & DEARBORN	68
553	104-2	104-1	CNT	375	8	GILBERT & DEARBORN	68
554	105-1	106-2	CNT	370	9	HAUSER & DEARBORN	68
555	105-2	105-1	CNT	371	9	STUART & DEARBORN	68
556	105-2	088-1	CNT	390	12	BENTON & FLOWeree	68
557	106-1	091-2	CNT	384	21	DEARBORN & KNIGHT	5
558	106-2	106-1	CNT	365	9	KNIGHT & DEARBORN	NR
559	107-1	108-2	CNT	379	9	400 ALLEY POWER	68
560	107-2T	107-1	CNT	355	8	400 ALLEY HOLTER	68
561	108-1	109-1A	CNT	195	9	400 ALLEY FLOWeree	68
562	108-2	108-1	CNT	351	9	BENTON & KNIGHT	68
563	109-1	110-2	CNT	337	9	KNIGHT & DEARBORN	68
564	109-1A	109-1	CNT	385	9	400 ALLEY HOLTER	68
565	110-1	106-1	CNT	50	3	DEARBORN & KNIGHT	2
566	110-2	110-1	CNT	370	8	400 ALLEY KNIGHT	NR
567	112-1	113-2	CNT	213	8	FLOWeree & MADISON	68
568	112-2	112-1	CNT	378	10	DEARBORN & KNIGHT	68
569	112-3	112-2	CNT	380	9	POWER & MADISON	68
570	113-1	114-2	CNT	371	9	HAUSER & MADISON	68
571	113-2	113-1	CNT	367	9	STUART & MADISON	68
572	113-2	105-2	CNT	382	8	FLOWeree & MADISON	68
573	114-1	106-1	CNT	388	15	GILBERT & MADISON	68
574	114-2	114-1	CNT	364	9	POWER & MADISON	68
575	116-1	112-3	CNT	360	7	HOLTER & MADISON	5
576	116-2	116-1	CNT	350	9	HOLTER & HARRISON	4
577	116-1	113-2	CNT	389	9	DEARBORN & KNIGHT	5
578	114-1	112-1	CNT	363	8	KNIGHT & MADISON	5
579	1178-1	114-1	CNT	387	12	HOLTER & MADISON	4
580	180-1T	180-2	CNT	239	8	HAYES & POWER	3
581	180-2	180-3	CNT	360	8	HOLTER & HARRISON	1
582	180-3	181-1	CNT	360	8	MONROE & POWER	5
583	180-3L	180-3	CNT	360	8	HARRISON & POWER	5
584	181-1	112-2	CNT	356	7	MONROE & POWER	NR
585	182-1	112-1	CNT	361	8	MADISON & POWER	68
586	183-1T	183-2	CNT	364	9	HOLTER & GILBERT	68
587	183-2	184-1	CNT	360	8	HOLTER & HARRISON	NR
588	184-1	116-1	CNT	350	9	HARRISON & LAWRENCE	5
589	186-1T	186-2	CNT	270	9	HOLTER & MONROE	68
590	186-2	186-3	CNT	345	9	MADISON & LAWRENCE	3
591	186-3	098-1	CNT	233	9	HOWIE & LAWRENCE	68
592	186-3L	186-3	CNT	175	8	MADISON & LAWRENCE	NR
593	187-1	087-1	CNT	356	7	HOLTER & LAWRENCE	68
594	225-1	184-1	CNT	412	6	HOLTER & MONROE	4
595	226-1T	182-1	CNT	285	6	GILBERT & HARRISON	NR
596	227-1L	227-2	CNT	46	8	HAYES & POWER IS	68
597	227-2	180-2	CNT	150	8	POWER & HAYES	3
598	232-1	232-2	CNT	370	8	HAUSER & HARRISON	5
599	232-1L	232-1	CNT	145	8	STUART & HARRISON	NR
600	232-2	178-1	CNT	145	8	KNIGHT & HARRISON	5

Record#	MANHOLE#	DNWADDR	FLOWEREE & MONROE	PIPE TYPE	SIZE	LENGTH	AREACODE	MAIN RATE
601	272-1	GILBERT & MONROE		8 VCP	68	172		NR
602	272-1L	MONROE & GILBERT IS		8 VCP	68	338		NR
603	272-2	FLOWEREE & MONROE		8 VCP	68	366		NR
604	273-1	STUART & MONROE		8 VCP	68	371		NR
605	273-2	HAUSER & MONROE		8 VCP	68	368		NR
606	274-1	KNIGHT & MONROE		8 VCP	68	356	10	NR
607	275-1T	HARRISON & KNIGHT		10 VCP	68			
608	275-2	GILBERT & HAYES IN		9 VCP	68	326		NR
609	275-3	FLOWEREE & HAYES		9 VCP	68	208		NR
610	276-1	STUART & HAYES		9 VCP	68	371		NR
611	276-2	HAUSER & HAYES		9 VCP	68	371		NR
612	277-1	KNIGHT & HAYES		9 VCP	68	371		NR
613	294-1	MOND & GILBERT		10 VCP	68	334		5
614	294-1L	HAYES & GILBERT		10 VCP	68	370		NR
615	295-2	GILBERT & MOUND		8 VCP	68	232		NR
616	352-1	HAUSER & HAYES		8 VCP	68	205		NR
617	352-3	HAUSER & GARFIELD		8 VCP	68	334		5
618	352-3L	STUART & GARFIELD		8 VCP	68	334		3
619	503-1	FLOWEREE & GARFIELD		8 VCP	68	334		NR
620	503-1A	GARFIELD & FLOWERE		6 VCP	68	79		NR
621	520-1	HOLTER & HAYES IS		8 VCP	68	414		NR
622	520-1L	HAYES & HOLTER IS		8 CMT	68	74		NR
		BOULDER & MONTANA IW		8 VCP	48	400		NR
		BOULDER & MONTANA 2W		8 VCP	48	125		NR



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